APRIL, 1971

WEEDS TREES and TURF

INSTALLING IRRIGATION WITHOUT TRENCHING

IMPORTANT — Subscription Renewal Notice on Page 10

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WEEDS TREES and TURF®

Volume 10, No. 4 April, 1971

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Special for This Issue

Irrigation by Saber Slice 16
Contractor Jack Soderstrom installs irrigation systems with practically no turf renovation being necessary. He uses a Saber plow to slice in plastic pipe.

How to Evaluate a Fertilizer Bid 18
The lowest bid may not always be the most economical, says Ron Smith, Bowling Green University horticulturist. He provides a formula for getting your money's worth — and justifying your buying decisions with the boss.

Flame Weeding 22
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To Trim a Tree Artistically 24
If you aren't born with the talent, Bill Johnson of Phoenix, Ariz., says you can learn. He lists 10 hints.

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The Cover

If the tractor driver were willing to risk getting hit by a golf ball, play could go on uninterrupted during the installation of an irrigation system — the way Jack Soderstrom does it. He puts in plastic pipe, down to 3½ feet, without digging a trench. From a beginning hole, he works with a machine called a Saber Plow that slices the ground. At the bottom of the slit, not wide enough for a golf ball to fall into once following wheels squeeze it shut, the plow pulls in irrigation pipe. The operator on the cover is slicing around a green. More about this kind of irrigation installation is reported beginning on page 16.

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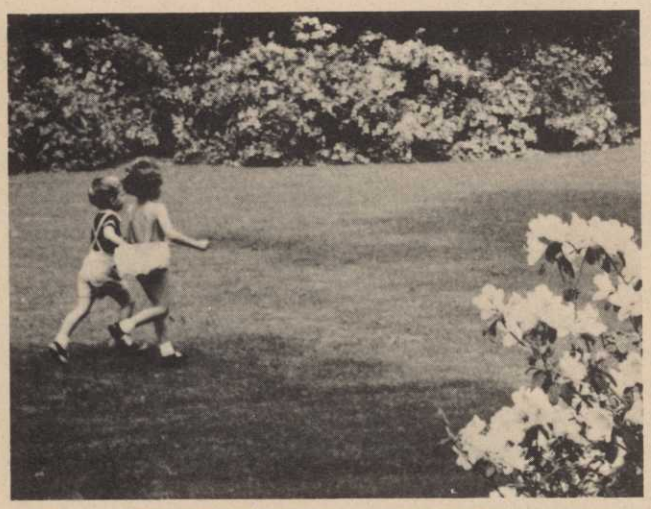

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It follows because Banvel is an elite product, a top quality product, an economical product (9¢/1000 sq. ft.). The product you can count on to do the important job of eliminating the commonest and toughest broadleaf weeds in a broad range of tolerant turf species.

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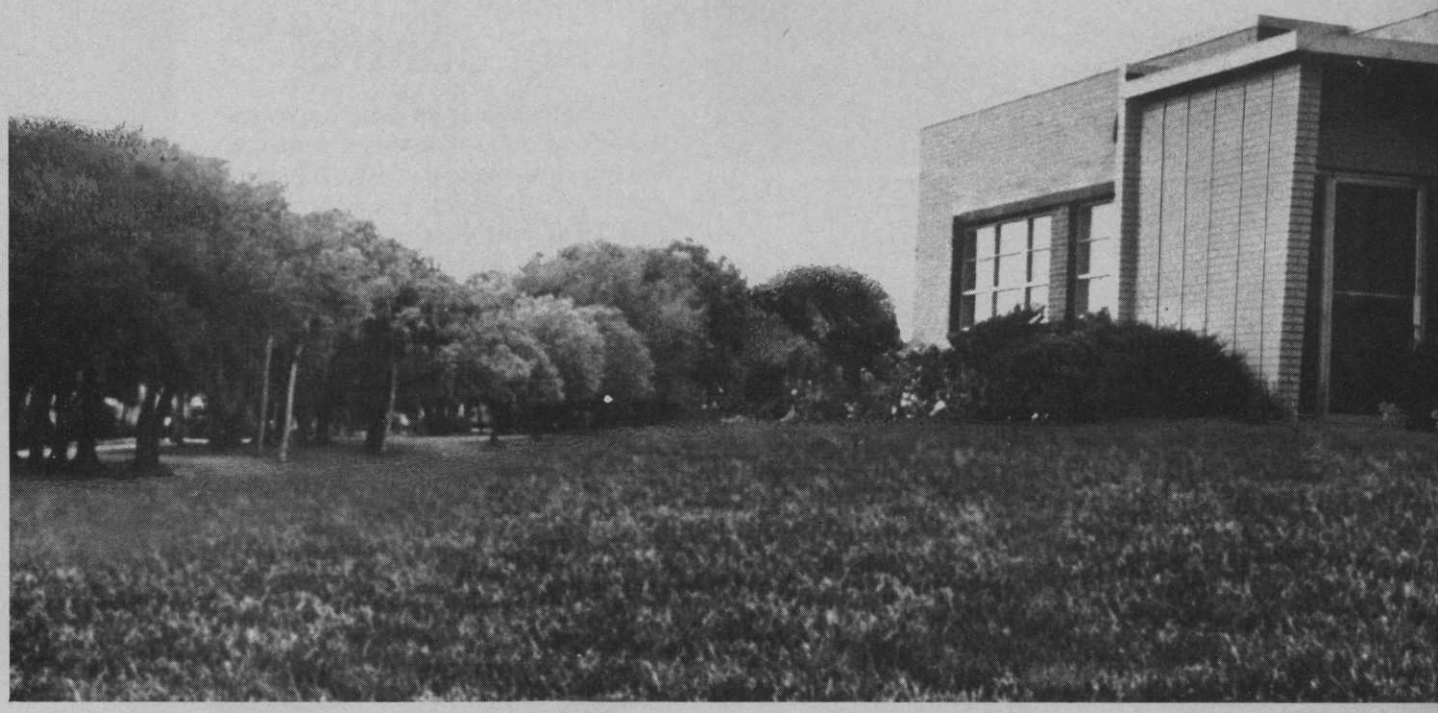

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Although Chlordane has long-lasting action, *it does not magnify biologically*. Residues have seldom been detected in foods, water, fish, or wildlife. When detected, they have been insignificant.

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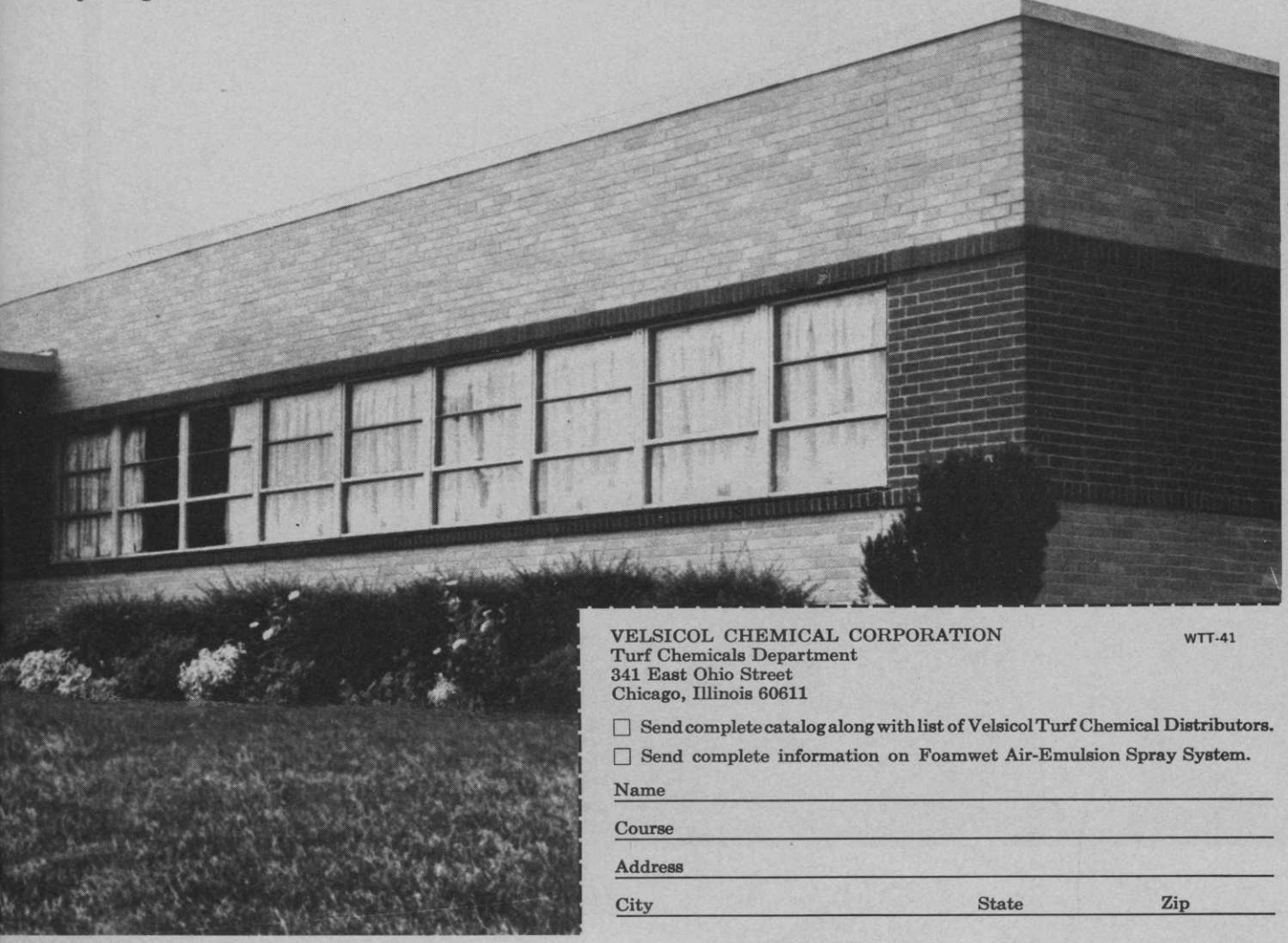

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Your Competition Has the Edge

WHAT A WEALTH of information was wasted at the barrage of conferences in recent months! We say it was wasted because you weren't there. Like money, information has to be used to really be worth something.

Since you support this magazine, however, we felt obligated to warn you that your competition has a keen edge on you—the competition that was represented at the meetings.

At one conference, a fellow thumbed this magazine and told his listener: "You hardly need to go to these meetings; you can read it all in here." Well, we appreciate the compliment, but have to confess that we just aren't physically capable of telling it all.

One company described a new growth regulator that should be on the market by 1973. It would be premature for us to talk about it in print, but you could have witnessed how good it looks two years before you could buy it. One poolside conversation overheard was about one man and one truck getting $60,000 of tree spray business in one year. And he was working in a northern state with a short growing season. Most conferences include a session on pesticide regulation that's pertinent to the region. There is new equipment galore—and nothing's better than "getting the feel of it" in a relaxed atmosphere. Latest research is always a part of these conferences. We report what we believe is significant. However, we can't always hit upon what's significant to each of you.

Couldn't afford to go? Could you afford **not** to go?

We believe it is vital for a trade magazine to be present at as many conferences as we can. How else could we keep attuned to the industry? True, we rarely see other magazines there. But then, we feel we, too, have an edge on the competition.

Guest speaker Don Santy, addressing the Pacific Northwest Pesticide Applicators, offered some of the reasons for joining an organization that holds periodic conferences. Among them: To establish a professional image (a speaker at another conference said the way to raise the level of your profession is to raise your level of knowledge); to establish friendships with peers; to learn something; for sheer enjoyment of a new adventure; to create anticipation of better things to come, through establishment of goals, and plans to reach them; to attain personal or business security through the collective strength an organization offers.

To be successful, Santy said, an organization must provide motivation, enthusiasm, membership growth, leadership and planning. Most of the meetings we've attended provide all these things. See what you've been missing. See the advantage your competition has on you.

Gene Ingalsbe

TIME TO RENEW: Your Renewal Card Is Bound In Above

(Second Notice)

We need your okay to continue sending you WEEDS TREES and TURF magazine on a *free* basis. In fact, we must have it.

We—and other publishers—have been somewhat remiss in the past in that we've sent your copy of the magazine whether or not you sent your card in. This can no longer be done.

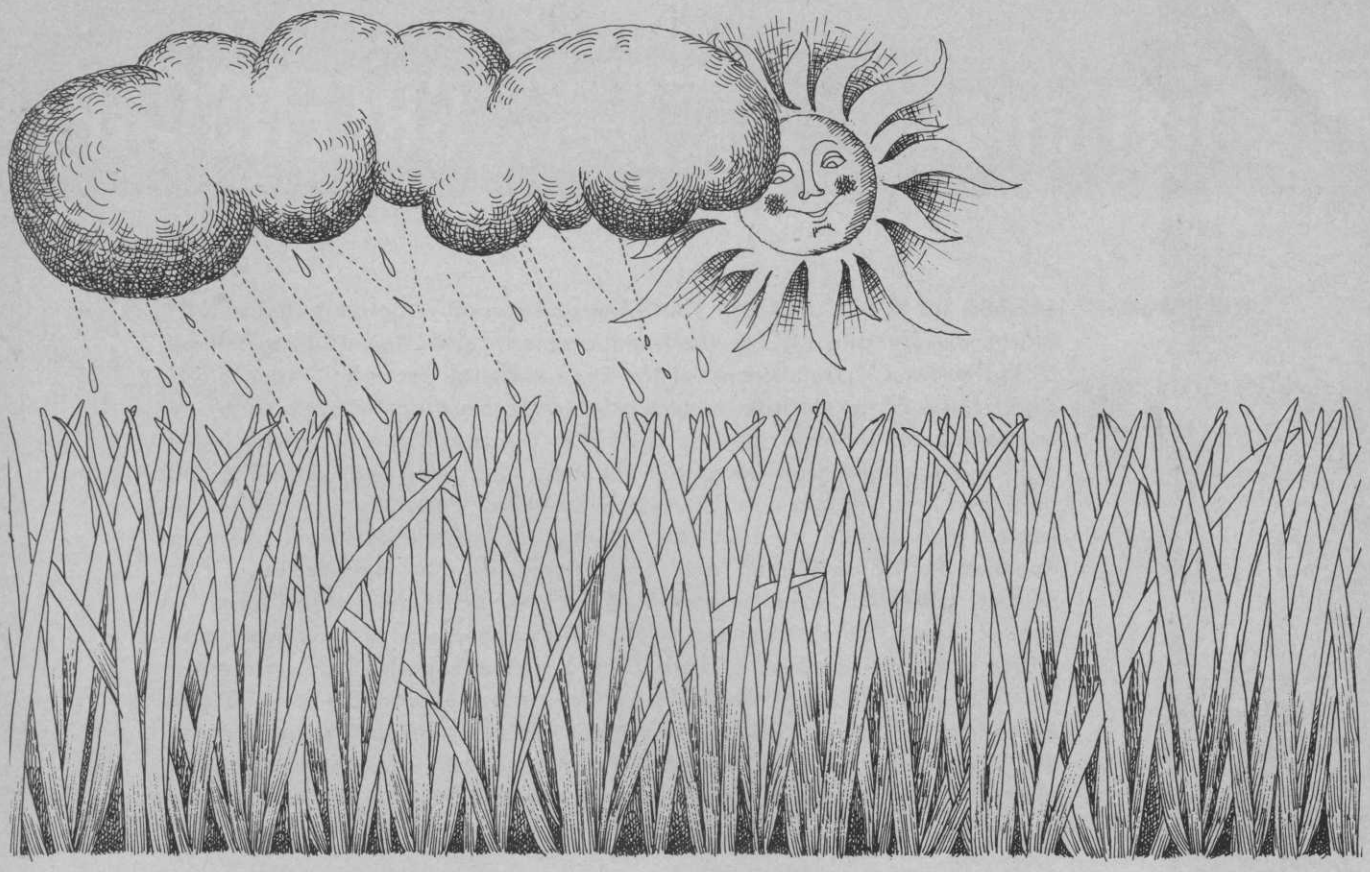
As you know, subscriptions are free to bona-fide members of the industry. You qualify. But economics has again reared its head and we must stabilize our circle of readers. We shall maintain the magazine circulation at 33,000—the number which constitutes the basis for our advertising rate. No additional magazines will be sent except at the published rate of $10 per year in the U. S. and Canada.

MAY WE HEAR FROM YOU—by way of the bound in card above? Simply tear it out—*SIGN* and check your answers. DO NOT LOSE YOUR FREE SUBSCRIPTION TO SOMEONE ELSE. We want your continued support and we need you on our list.

Thank you.

Art Edwards, Editorial Director

(This renewal notice is a requirement of our national auditing service to verify that you are a member of the industry and that you wish to receive the magazine.



Shell's Akton® Insecticide controls chinch bugs in turf for up to 8 full weeks. Rain or shine.

At 1¼ lbs. per acre, Akton® keeps turf green for up to 10 full weeks. That can mean a full 2 months between applications.

Akton kills both resistant and non-resistant chinch bugs and it also kills sod webworms. Rain won't hinder its performance. And it has no known phytotoxicity among ornamentals or other plants.

Akton is competitively priced with other currently used insecticides. And, because it kills chinch bugs for up to 8 weeks, you can save by scheduling your maintenance on an every-other-month basis.

For up to eight weeks of effective chinch bug control, Shell's Akton does the job. Rain or shine.

For information, write: Shell Chemical Company, Peachtree Center Station, P. O. Box 56144, Atlanta, Georgia 30343.

Shell does a better job.

SHELL

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the national GREENSCAPE

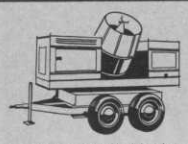
NO IMMINENT HAZARD TO PUBLIC HEALTH! That's the decision on remaining uses of DDT, aldrin, dieldrin and 2,4,5-T. The announcement came Mar. 18 from William D. Ruckelshaus, administrator of the Environmental Protection Agency. The significance of the decision, prompted through court action initiated by the Environmental Defense Fund, is two-fold: The products will not be immediately suspended from interstate shipment and use; and, secondly, that benefit-risk values can now be considered before determining whether registered uses should be cancelled. Notices of cancellation had been announced for all remaining uses of the products, but manufacturers filed protests within 30 days, as permitted by law. This action necessitated the conduct of an "administrative review," either by a scientific advisory committee or public hearings, or both. Such a review is under way on the four products. The review opens the way for a more reasonable decision, because as a part of the EDF vs. Ruckelshaus decision the court recognized that the "cancellation decision does not turn on a scientific assessment of hazard alone. The statue leaves room to balance the benefits of a pesticide against its risks."

FERTILIZER PRICING should remain extremely competitive through 1971. The reason is that it still will take several years for demand to catch up with production capabilities, according to a Chase Manhattan Bank chemicals technical director. There still is over-capacity in manufacturing facilities, says Richard E. Anderson, but he forecasts a limited improvement in profit and pricing in 1971. The over-capacity developed, he said, primarily because companies outside the chemical industry got in the business hoping for higher returns. Now that investments in chemicals are less attractive, he concluded, there should be a showdown in capacity buildup.

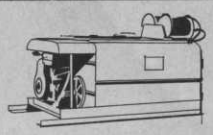
ENTOMOLOGICAL SOCIETY OF AMERICA has announced the establishment of the American Registry of Certified Entomologists. The Registry, the result of a 10-year study, will identify specialists with the training and technical ability to advise the public on matters pertaining to man and his environment, according to Robert H. Nelson, Society president. Initially, 15 classifications are available. They include: Agricultural entomology, physiology, toxicology, medical and veterinary entomology, regulatory entomology, pest management, pesticide research, and urban entomology.

WHITE-FRINGED BEETLE QUARANTINE has been extended to all or parts of 30 previously unregulated counties and two cities in seven states, reports USDA. These areas are: Counties—Clay, Lawrence and Union in Arkansas; Hamilton in Florida; Appling, Carroll, Chatham, Columbia, Douglas, Haralson, Jenkins, Madison, Mitchell, Rockdale and Whitfield in Georgia; Caddo, Grant, Iberville and West Feliciana parishes in Louisiana; Rowan and Pitt in North Carolina; Decatur, Giles, Hamilton, Lewis, Maury, Rhea, Roane, Rutherford

This Rotomist® sprayer has the greatest "rate-of-work" capacity ever developed for shade tree work. It is a design that provides a *controlled air pattern*, all the way to the top of the tallest trees. This means adequate coverage, as well as more efficient use of your chemicals. It means versatility, because the Rotomist pivots 110° vertically, rotates through 360° horizontally. Which means you can put your spray material—either dilute or concentrate—anywhere you want it. Up in trees. Over an embankment. Down, to windrow leaves. And, of course, John Bean makes many Rotomist models to match your requirements. They all mean business.

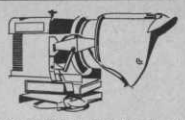


ROTOMIST available in a wide range of capacities.



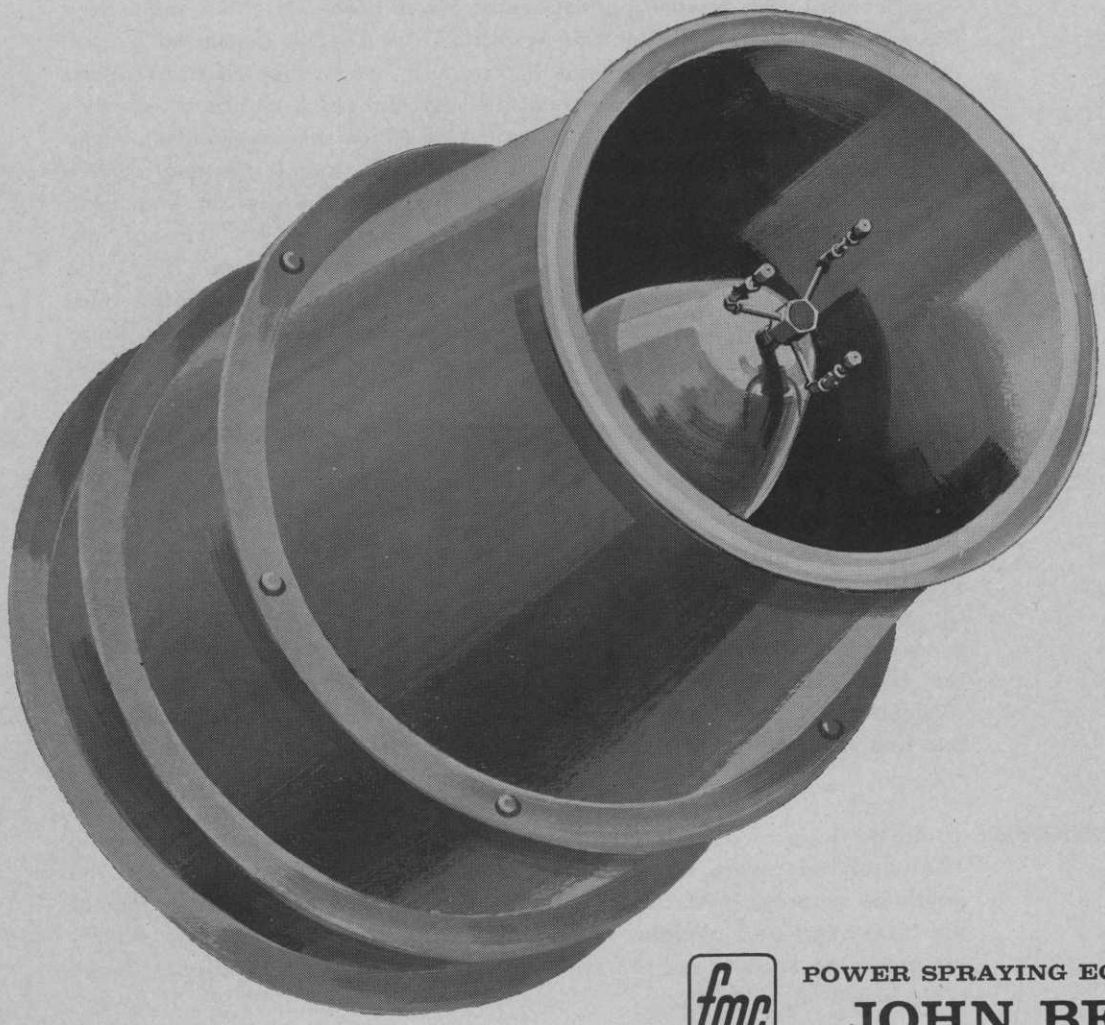
ROYALIER SKIDMOUNTED delivers 20 gpm at 400 psi

MODEL 1010 TURFKEEPER has flotation tires for golf course use.



ROTOCAST broadcast air sprayer effectively handles all weed-killing programs.

Spray control is straight-through air



POWER SPRAYING EQUIPMENT

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DIVISION

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and Wayne in Tennessee; Cities—Arlington and Falls Church in Virginia. White-fringed beetle quarantine restrictions are now in effect in all or parts of Alabama, Arkansas, Florida, Georgia, Louisiana. Mississippi, North Carolina, South Carolina, Tennessee, and Virginia.

USDA IS COMPUTERIZING its plant pest interception records. The first computerized version of its annual List of Intercepted Plant Pests (ARS 82-6-4) is now available. This 56th annual report lists pests of known or potential importance to agriculture that are not known to occur or are not widely distributed in this country. It covers July 1, 1968, to June 30, 1969. Some 11,658 significant interceptions at U. S. ports of entry of insects, mites, mollusks, diseases and nematodes are tabulated by country of origin.

AN ADDITIVE FOUND TO ENHANCE THE EFFICIENCY OF HERBICIDES may lead to effective weed control with fewer applications at lower herbicide rates, believes a USDA scientist. Phenylcarbamate herbicides are readily degraded by soil micro-organisms, said Dr. Donald D. Kaufman, and repeated applications often are needed to control weeds effectively. But research has shown that certain methylcarbamate chemicals (some of which are insecticides), when applied along with certain herbicides, temporarily inhibit the degradative action of the soil micro-organisms. Dr. Kaufman said he and Dr. Charles S. Helling found that p-chlorophenyl methylcarbamate (PCMC) strongly inhibited the biodegradation of propham and chlorpropham. They also learned that to obtain the least herbicide degradation, the inhibitor must remain close to the herbicide. If the technique is to be effective, Dr. Kaufman said, care must be taken to match the mobilities of the inhibitor and of the herbicide.

A SPECIAL ORNAMENTAL HORTICULTURE TECHNOLOGY CURRICULUM with guidelines for suggested two-year courses has been published by the Department of Health, Education and Welfare. The curriculum was developed to aid in planning and developing two-year post high school programs, or in evaluating existing ones. Areas covered are landscape, nursery, floriculture, turfgrass and arboriculture; and includes suggested course outlines, lists of text books, and related subjects. One chapter of the book is devoted exclusively to facilities and equipment and cost with each broken down for the five horticulture curriculums.

GRASSHOPPERS could be more of a problem on western and midwestern rangelands in 1971 than they were last year, warns USDA. A fall survey indicated the potential severity; a spring check will give a more accurate estimate of the infestation and pinpoint areas likely to require control efforts. Ranchers are being encouraged to treat infested areas before grasshoppers leave their breeding grounds.

A Princep foundation gets most weeds before they become weeds.

It's a more attractive way to keep bare ground bare. Using Princep® herbicide to kill weeds before they come up. That way you don't have a lot of ugly dead weeds hanging around as you do with contact weed killers.

Not that Princep eliminates the use of contacts entirely. You may need them to get the few weeds Princep misses. But starting with Princep as the foundation for your herbicide program you can solve the bulk of your weed problems. More economically and safely than anything else.

In fact, just about the only thing in any danger from Princep are weeds. It's safe to use. There's minimal leaching and no contact action, so it's safe to nearby crops and ornamentals.

So if your object is bare ground weed control, use the safe heribicide. And the best foundation herbicide. Princep.

For information about Princep, brand of simazine, and other Geigy herbicides, AAtrex®, Pramitol®, and Atratol®, write to Geigy Agricultural Chemicals, Division of CIBA-GEIGY Corporation, Ardsley, New York 10502.

Princep by Geigy

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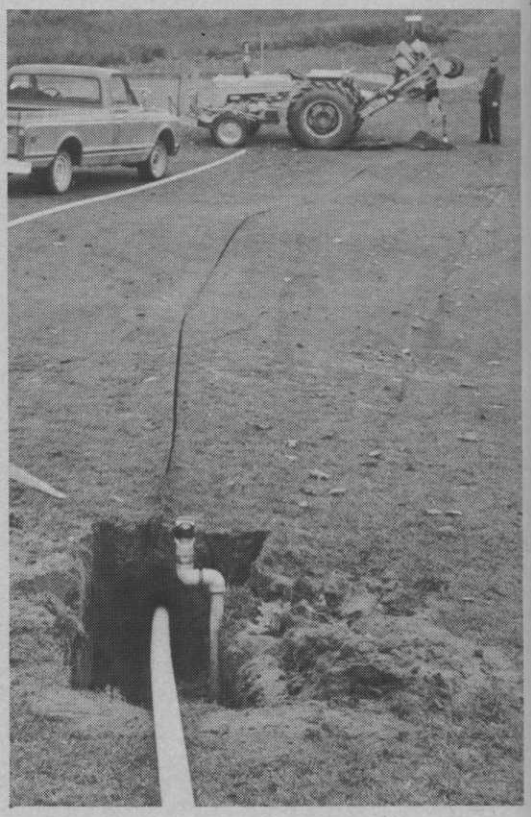
Jack Soderstrom Tells How to Install

IRRIGATION BY SABER SLICE



WHEN IT COMES to installing sprinkler systems in existing golf courses, Jack Soderstrom has a better idea. Soderstrom, of Sparta, Mich., has been an underground contractor for the past 20 years, but, since 1965, he has specialized in irrigating golf courses. His better idea consists of plowing in the plastic pipe which carries the water.

To do this, Soderstrom uses a machine called a Saber Plow, a tractor-type machine equipped with a vibratory blade in the rear that can bury cable, wire, tubing and pipe down to depths of 3½ feet. Manufactured by Parsons Division of Koehring, Newton, Ia., the Saber Plow provides a major benefit of requiring no restoration.

Thus on existing golf courses, Soderstrom estimates the course savings in restoration at close to 80% because no restoration of turf is required. Naturally this gives him a keen competitive edge over other methods of installation.

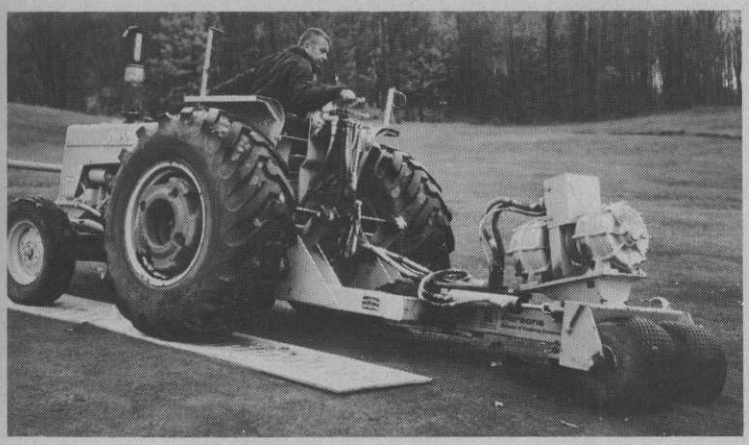
An example of this is a system he recently installed for the Newberry Country Club on its nine-hole course in Newberry, Mich.

Built in 1928, the course had an old, inadequate system that provided water only for the tees and greens — fairways were watered at the whim of Mother Nature. Soderstrom's bid was only slightly higher than the competitive bid based on trenching in the pipe. The considerable restoration of grass required would then have had to be completed by the Club's grounds crew.

To put in the new system, designed by Soderstrom and Spartan distributors of Spartan, Mich., Soderstrom used 4, 3, 2½, 2 and 1½ inch pvc pipe (polyvinylchloride) of 160 P.S.I., and 6- and 8-inch cement-asbestos pipe. Celanese Corp. manufactured the pvc pipe while Flintite Corp. produced the asbestos variety. All the pipe 3 inches in diameter and smaller, the majority of the system, was plowed in with the DP-30 Saber Plow. For the remaining large diameter pipe, Soderstrom used a Parsons 150 trencher and backfilled with a Case dozer. In all, a total of 16,000 feet of pipe was installed.

Although the Newberry course will be a manual system, automatic systems also make up a good share of Soderstrom's work. These consist of individually controlled sprinkler heads, automatically and individually activated with clocks, which spray water for a period of time preset according to soil conditions. On nine-hole automatic courses, an additional 60,000 to 64,000 feet of control tubing and wires are plowed in. To better handle these controls, Soderstrom added a special handling rack to the front of the DP-30.

All elements of installing an irrigation system with a Saber Plow are shown in this series of pictures. Beginning at the left is the tractor-pulled plow slicing around a green. Plastic pipe is attached to the bottom of the plow by chain and is pulled into place as the tractor moves forward. Holes are needed only for initial entry and for connecting sprinklers. The slice knits quickly. Flotation-type tires help close the slit. When it is necessary to drive on the green, sheets of plywood are used to prevent tire indentations. Installation of joints where sections of pipe meet at a 90-degree angle is a simple operation requiring a matter of minutes to complete. A special carrying attachment handles miles of control cable needed to complete the automatic system.



Because of these controls, the cost of an automatic system is about twice that of a manual system. Average costs, according to Soderstrom, including installation and complete parts, are about $25,000 for a nine-hole manual course, $45,000 to $50,000 for a nine-hole automatic or an 18-hole manual, and $80,000 to $90,000 for an 18-hole automatic.

On Newberry's new manual course, to water fairways the grounds keeper waters the desired area by means of a key that he fits into a quick coupling valve. The Toro sprinkler head is at the top of the key. When the area is sufficiently watered, the key is removed and taken to the next coupling valve. System capacity is 500 gallons per minute and, since one sprinkler requires 50 gallons per minute, 10 sprinklers can be activated at once.

On greens and tees there are permanent in-ground sprinklers, three or four to a green, two or three on a tee, depending on the size of the green or tee, which all pop up when the water is turned on via a nearby valve. Greens sprinklers each shower 15 gallons of water per minute.

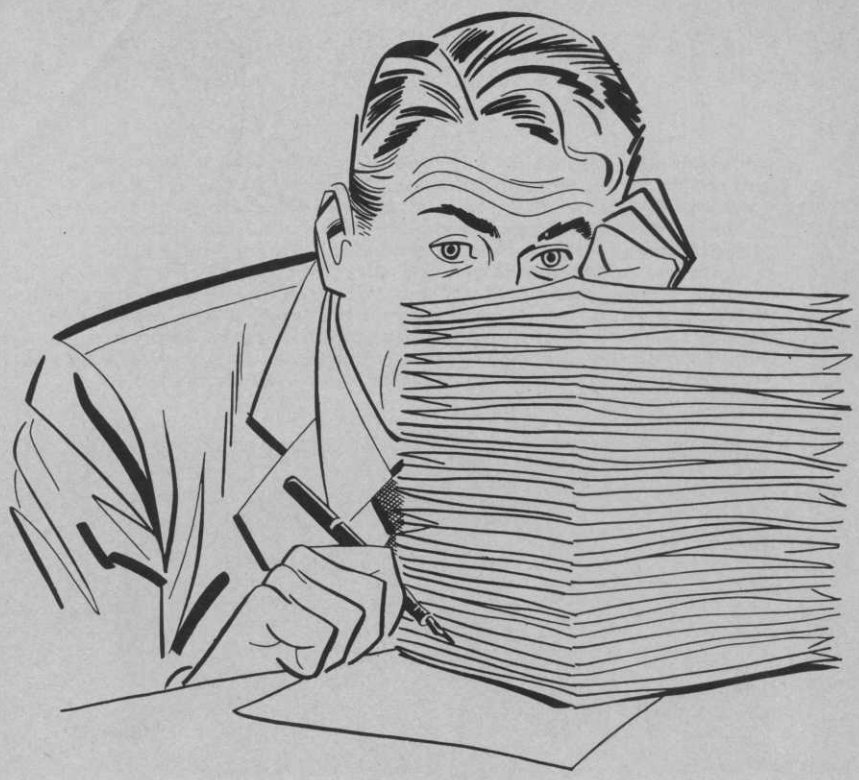
On the fairways, the distance between sprinklers was 90 feet (as specified by the course architect) and Soderstrom plowed in 180 feet of pipe at a time, enough to include three sprinkler heads. The Saber Plow pulled the fairway pipe in with a 24-inch blade.

An 18-inch blade was used on the greens. After the line was plowed around the green, the pipe was simply pushed in by hand — a faster process since the time required was a matter of two-three minutes.

Soderstrom described the DP-30 Saber Plow as, "Nothin' but good. To my knowledge, we are the only contractor in this area using a plow in this type of application. Because the golf courses save on restoration, we are considerably cheaper. On this course, conditions are excellent. The soil is pure sand and we have been able to do all the plowing in second gear."

Soderstrom, who covers the entire state of Michigan, spent about three weeks on the Newberry job and normally handles three or four golf course jobs per year, about half being automatic systems. He spends about eight months of the year on jobs and the remaining four months overhauling equipment, and handling sales contact and planning work for the next year.

With improved grass and ground conditions next year at Newberry, golfers will have one less excuse for not breaking par during their own watering stop at the 19th hole.



HOW TO EVALUATE A FERTILIZER BID

By RON SMITH, horticulturist
Bowling Green State University
Bowling Green, Ohio

ONE OF THE MAJOR problems encountered by individuals in the turf industry, has been how to properly and fairly evaluate the comparative costs of various types of fertilizers. This is further complicated in that various manufacturers produce such a variety of different analyses and types.

First, let's be realistic and admit that it would be virtually impossible to compare and evaluate all types. Also, in most cases, the superintendent is not interested in a wide range of types. His mind is pretty well made up in advance as to just what he wants. He should have basic parameters established on what would constitute an acceptable fertilizer. Specifications should be listed that are restrictive enough to give him what he wants, and yet broad enough to provide several manufacturers the opportunity to submit competitive bids.

An example this could include some of the following:

1. A homogeneous granular or pellet.
2. NPK ratio within 15% of 3-1-2.
3. Not less than 30% of organic nitrogen and activity index.
4. List of desirable trace elements.
5. Range of screen or sieve sizes.

Of course many more could be added to this list, or changed to fit the individual's needs.

Once this has been completed, we are ready to begin our evaluation of comparable products.

In the example listed above, we used a 3-1-2 ratio of NPK as our desired analysis. Therefore, the fertilizer contains six total units of NPK. Of this, nitrogen constitutes ½ of the total units, so it should amount to about ½ of the bid price. The cost per pound of actual nitrogen can then be computed, based on the percent of N in the formulation and ½ of the bid price.

In general, we can assume that nitrogen costs three times as much as potash and phosphate costs twice as much as potash. This then, gives us the following formulas for computing the relative cost of our three major ingredients:

$$\text{cost/lb. of actual N} = \frac{\text{½-Ton bid price}}{(2{,}000)\ (\text{\% of N})}$$

$$\text{cost/lb. of actual } K_2O = \frac{\text{cost/lb. of N}}{3}$$

$$\text{cost/lb. of actual } P_2O_5 = (2)\ (\text{cost/lb. of } K_2O)$$

Now that we have these basic costs, we can expand them into a more realistic cost of the total fertilizer, based upon the percent of content of each of them.

A = % of N in formulation
B = % of P in formulation
C = % of K in formulation
N = Cost/lb. of actual N
P = Cost/lb. of actual P_2O_5
K = Cost/lb. of actual K_2O

Using the above figures, we can now reach a relative cost value for 100 pounds of fertilizer with the following formula:

$$(A)\ (N) + (B)\ (P) + (C)\ (K) = \text{Formulation value/100 lbs.}$$

The cost can now be calculated, based on the above figure, to put one pound of actual N plus all other ingredients on 1,000 sq. ft. of turf area.

This final figure is the one used for comparison of values, and should never be treated as an absolute. It is a relative figure, as are the figures it will be compared against.

Let's use a hypothetical case and see if the formula works!

The following three bids are received:

1. 15-5-10 @ $100.00 per ton.
2. 18-6-12 @ $120.00 per ton.
3. 13-4-9 @ $105.00 per ton.

First bid: $100.00/ton for 15-5-10.

$$\text{Cost/lb. N} = \frac{50.00}{(2{,}000)\ (.15)} = .17¢/\text{lb.}$$

$$\text{Cost/lb. } K_2O = \frac{.17}{3} = .06¢/\text{lb.}$$

$$\text{Cost/lb. } P_2O_5 = (2)\ (.06) + .12¢/\text{lb.}$$

THEREFORE:

$$(A)\ (N) + (B)\ (P) + (C)\ (K) = \text{Formulation value/100 lbs.}$$

$$(.17)\ (15\%) + (.12)\ (5\%) + (.06)\ (10\%) = \$3.75/100 \text{ lbs. or } 3.8¢/\text{lb.}$$

Fertilizer that contains 15% nitrogen will require 6⅔ lbs. of fertilizer per 1,000 sq. ft. to apply 1 lb. actual N/1,000 sq. ft.

Thus, actual cost becomes 3.8¢ times 6/66 lbs. or 25.3¢ per 1,000 sq. ft. of turf area.

Second bid: $120.00/ton for 18-6-12.

$$\text{Cost/lb. N} = \frac{60.00}{(2{,}000)\ (.18)} = .17¢/\text{lb.}$$

$$\text{Cost/lb. } K_2O = \frac{.17}{3} = .06¢/\text{lb.}$$

$$\text{Cost/lb. } P_2O_5 = (2)\ (.06) = .12¢/\text{lb.}$$

(Continued on page 20)

Scotts presents 4 new ways to feed your sod field.

1. That monster bag with the sling handles. It holds nine acres of Scotts ProTurf fertilizer—which saves you heaps of buying and storing. Very handy. And besides fitting neatly onto the arms of a forklift, it's equipped with a sliding-panel trapdoor . . . but more about that later. First, here's what comes in that monster bag:

2. Scotts ProTurf Starter Fertilizer—if you're just beginning a field of tender seedlings. Available in both the nine-acre monster or standard half-acre bags, it's a lightweight homogeneous product that spreads easily and evenly. And, thanks to Scotts' research-backed balancing of phosphorus/potassium/nitrogen, it feeds your young field a rich, energetic diet. Trionized bonding insures a controlled nutrient diet especially for developing new turf seedlings.

3. Or Scotts ProTurf Sod Field Fertilizer, if your grass is at a later stage. It comes in the big sling bin or the half-acre bags, too. Like ProTurf Starter, it's surface-applied, odorless, and dust-free. Being a Polyform product, it has less bulk and weight — and its controlled release nurtures the seedlings at the time they really need it. As part of Scotts' total ProTurf program, this means you'll have an earlier crop than usual. Not to mention a better product.

4. Now. Back to the sliding trapdoor. Scotts designed it so when the monster bag's hanging there on the forklift, all the forklift operator has to do is lean forward . . . pull the sliding panel . . . and watch while the fertilizer empties out into a Superspreader. Superspreader has a fully extended wingspan of 28 feet and can handle four thousand pounds of fertilizer (about three and a half monster bags) at one clip. There's a new automatic feed shutoff: when you slow down, the feed slows down; when you stop, it stops. That means no more burnt patches or starved spots when you swing around to start a new row. And—a last beautiful touch—the same worm-gear feeder that provides accurate spreading can be cleaned out afterwards. In five minutes.

A really professional lineup, for really professional sod growers. Because Scotts understands sod. They've put a hundred years of grass-growing knowhow behind every one of these new products . . . years of lab research, greenhouse development, and plot testing. That's the best new product recommendation you can get anywhere.

FREE SOIL PROBE. An 8½" long Soil Probe is yours free, just for asking us for more information about Scotts 4 new ways to feed your sod field. Send us the coupon below, and we'll see that you find out all about the monster bag, the 28-foot Superspreader, ProTurf Starter Fertilizer, and ProTurf Sod Field Fertilizer. And we'll throw in the chrome-plated Scotts Soil Probe absolutely free. Or if you're in a big hurry, call Paul Florence—collect—at 513 / 644-2900, in Marysville.

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O. M. Scott & Sons, Marysville, Ohio 43040

Send me my FREE Scotts Soil Probe. And give me all the information you have on Scotts 4 new ways to feed my sod field.

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PRINCIPLES OF TURFGRASS CULTURE by John H. Madison, Department of Environmental Horticulture, University of California, Davis. 405 pages plus index; 107 illustrations; 6 x 9; Van Nostrand Reinhold; $19.95. Publication date: March, 1971.

Principles of Turfgrass Culture is a compendium of the vast amount of literature available in the field. After noting the material, the author extracts general principles, then uses them to illustrate their bearing on various management problems and practices. Emphasis is placed on the interactions between different management practices and different environments; the principles are used to show the directions in which one can go and the compromises that are necessary to achieve certain goals.

The author provides complete coverage of the anatomy, morphology, genetics, taxonomy, and physiology of the turfgrasses—physiology and ecology are treated throughout the book as parts of almost every chapter. The author then explains climate, soils, plant nutrition, irrigation, salinity, and drainage.

An unusual feature of Principles of Turfgrass Culture is the inclusion of sections called practicum, or practical review, which make it possible to review quickly important practical applications of the scientific principles and data to field management. A second feature is the nexological approach that considers management practices as an interrelated network of the whole in which each affects the results of all the others — irrigation, mowing, disease control, fertilization, and so forth, are never considered as isolated bits in a program.

The ten chapters of Principles of Turfgrass Culture are as follows: Anatomy and Morphology of the Turfgrass Plant; Taxonomy, Cytology, and Genetics; Turfgrass Physiology; Turfgrass Climate and Microclimate; Soils; A Brief Introduction to Soil Chemistry and Plant Nutrition; Plant Nutrition and Fertilizers; Soil, Plant, and Water Factors in Irrigation; Irrigation Design; Drainage and Salinity. This important reference also contains a Glossary, Author Index, and Subject Index.

THEREFORE:

(.17) (18%) + (.12) (6%) + (.06) (.12% = $4.50/100 lbs. or 4.5¢/lb.

Fertilizer that contains 18% nitrogen will require 5½ lbs. of fertilizer per 1,000 sq. ft. to apply 1 lb. actual N/1,000 sq. ft.

Thus, actual cost becomes 4.5¢ times 5.5 lbs. or 24.75¢ per 1,000 sq. ft. of turf area.

Third bid: $105.00/ton for 13-4-9.

$$\text{Cost/lb. N} = \frac{52.50}{(2{,}000)\ (.13)} = .20¢/\text{lb.}$$

$$\text{Cost/lb. } K_2O = \frac{.20}{3} = .07¢/\text{lb.}$$

$$\text{Cost/lb. } P_2O_5 = (2)\ (.07) = .14¢/\text{lb.}$$

THEREFORE:

(.20) (13%) + (.14) (4%) + (.07) (9%) = $3.79/100 lbs. or 3.8¢/lb.

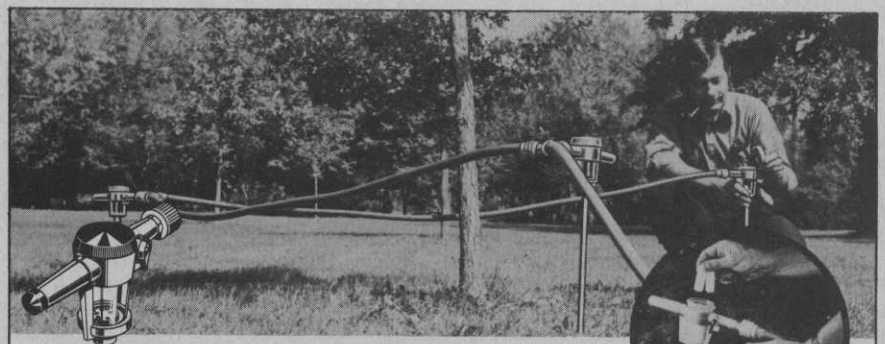
Fertilizer that contains 13% nitrogen will require 7⅔ lbs. of fertilizer per 1,000 sq. ft. to apply 1 lb. actual N/1,000 sq. ft.

Thus, actual cost becomes 3.8¢ times 7.66 lbs. or 29.1¢ per 1,000 sq. ft. of turf area.

Now—let's summarize these three bids.

1. 15-5-10 @ $100/ton = 25.3¢/1000 cost.
2. 18-6-12 @ $120/ton = 24.75¢/1000 cost.
3. 13-4-9 @ $105/ton = 29.1¢/1000 cost.

It becomes evident that the cheapest bid to start with was not necessarily the most economical as an end product. These figures are relative, and should be used for comparative purposes only. This method is much more accurate, and in many cases, will reflect a different cost than that shown by comparing the cost of N alone. This in turn gives the most important reasons for using this method of evaluation. It eliminates controversy and disagreement on the part of those bidding, and allows positive justification to superiors for final selection of a successful product.



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$29.00 complete. Write for complete details.
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Now Chemagro can control almost anything that harms grass

like insects

®BAYGON 70% Wettable Powder is now registered as an insecticide for application to lawns and turf. Economical, easy-to-mix sprays of BAYGON 70% Wettable Powder are noted for their long residual activity.

®DYLOX 80% Soluble Powder provides outstanding control of sod webworms. Three applications at monthly intervals will provide maximum control.

like nematodes

®DASANIT nematicide is registered for the control of nematodes on established commercial turf grass throughout the United States. Merely apply the low-cost recommended dosage of DASANIT and drench with water to leach the material into the root zone and provide fast, maximum control on contact. Each application provides protection for up to 9 months.

like major turf diseases

®DYRENE turf fungicide is well known for the protection it provides against leaf spot, melting-out, copper spot, rust, *Sclerotinia* dollar spot, brown patch and snow mold. The 50% wettable powder formulation mixes easily with water, and may be applied with any standard sprayer without clogging nozzles or corroding metal parts. Dyed green to blend with turf and eliminate an unsightly deposit, DYRENE will not stain shoes or fabrics when dry.

like cottony blight

®DEXON fungicide is unsurpassed for long-lasting control of *Pythium*. Start treatment early before the disease appears, and repeat at 7-day to 14-day intervals throughout the season. DEXON will not cause leaf burn, and is compatible with other turf pesticides.

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Another Alternative for Weed Control

FLAME WEEDING

WEED CONTROL is becoming increasingly frustrating. Chemicals are accused of leaving residues. Biological controls are as yet impractical. Few desirable plants are omnipotent over weeds. Mowers can't be operated everywhere. So what else is there?

One company with more than 150 centers around the country says there's "flame weeding."

Surburban Propane Gas Corporation of Whippany, N. J., calls flame weeding with LP gas—propane—one of the most economical, safe and effective ways of dealing with weeds.

Here is how Mae D. Aucello, director of public relations, describes the fundamentals, application and advantages of flame weeding:

This method completely annihilates annual weeds by exploding the cellular structure of the plant. Propane's hot flame produces immediate results at the point of contact, without needlessly burning the surrounding areas. The main products of propane combustion—carbon dioxide and water—leave no harmful residual matter in the soil or air.

Despite the inherent "burn" nature of this method of weeding, it is being used effectively for destroying weeds along fences, tree borders, water bodies, drainage ditches, golf course roughs and sand traps, flower bed edges, road verges, around buildings and monuments, in service yards, on rugged terrain and in many other hard-to-maintain areas.

Flame weeding also is the perfect tool where control and not complete destruction is the object. It is excellent for banks and ditches where brush and weed control is a definite problem, yet a root system must be maintained in order to avoid erosion of the soil.

Flaming also is a simply way to control weeds before they become fire hazards along roadways and in unplanted areas. At the same time, it safely eliminates trash, unwanted plant growth, overgrown hedges and other materials in which disease-bearing organisms, insects, mites and rodents breed.

In these days of escalating labor costs, hand cutting, weeding and subsequent clearing or finishing of an area often are prohibitively expensive. One man with one tank of propane and flame weeding equipment can, in a few hours, dispose of weed problems that normally would require weeks of attention. Only one person is neded to accomplish weed control and debris destruction jobs ranging from large ground-clearing operations to the most delicate, time-consuming chores normally requiring hand labor. Furthermore, this work can be done any time, even in the rain, when other methods would be impossible.

A consistent, well-planned program of LP-gas flame weed control gets right to the "heart" of the weed problem, cures it and leaves no "post-operative" complications.

Various terms are used to denote

Suburban Propane has two basic equipment plans. One is a three-foot torch and 100 lb. cylinder mounted on a cart for intermittent light to medium flaming. The other is a trailer-mounted tank (325 to 500 gal., water capacity) easily towed by tractor or utility vehicle. Flaming destroys weeds by exploding the cellular structure of the plant.

methods of LP-gas weed control. "Non-selective burning" is the term applied when flame is used not only to kill weeds and annual grasses but also to kill-burn tops of perennial plants and row crops. "Pre-emergence burning" denotes the use of flame on a seeded area after weeds have come up, but just prior to the emergence of the seeded crops. This can kill a large percentage of weeds without damage to the crops themselves. "Selective burning" is the careful removal of weeds or other matter from specifically designated areas.

Suburban Propane, a pioneer in the LP-gas industry, has done much to popularize the economical "non-selective burning" method of weed control, which is finding increasing acceptance with golf courses, race tracks, parks, campsites, railroads, airports, cemeteries, apartment complexes, institutions and other establishments. Operation of approved LP-gas flame weeding equipment requires only minimal instruction.

One of the most complete flame weeding programs is offered by Suburban Propane, a major distributor of LP-gas with more than 150 centers in 33 states. Its over-all program includes a free demonstration at the prospective customer's location, providing the necessary equipment, training personnel, and scheduling delivery of propane to suit the customer's needs. Two basic equipment plans are offered by the company. The first, for intermittent light flaming to medium flaming, includes a 3 ft. "torch" and a 100-pound cylinder of propane which may be mounted on an easily maneuverable cart. The other, for medium to heavy-duty work, features an 8 ft. or 12 ft. "torch" and a 325- or 500-gallon (water capacity) tank of propane mounted on a fully equipped two- or four-wheel trailer, which may be easily towed by a tractor or utility vehicle. All equipment includes accessory fittings and has been approved by government regulatory agencies.

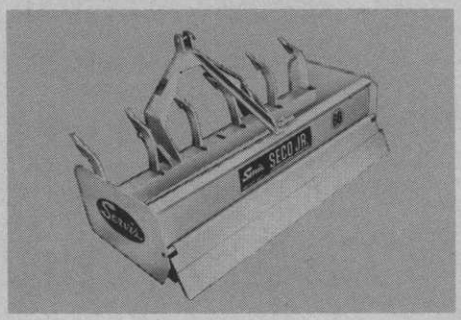
Many customers have bulk storage tanks installed on their own property from which the portable cylinder or tank can be refilled. This offers a convenient solution to a number of other problems because it represents an immediately available supply of propane for additional uses such as motor fuel for tractors, lift trucks and other internal combustion engines.

Further information may be obtained by circling (719) on the reader service card.

the budget scrapers

Servis' Automatic Lift-Trip Scraper pays for itself in time and work saved. Without leaving the seat, the operator can scarify and scrape at the same time...or level, grade, and backfill independently. Scarifier teeth raise and lock automatically when the box is raised. Teeth stay up until the operator "trips" the easy-to-reach handle. It's the most versatile and most productive box scraper on the market. Available in 66" and 72" models.

The SECO, JR. is a heavy-duty scraper for contractors who seldom need scarifiers. It saves money on the original investment. Scarifier shanks and teeth can be easily installed manually later, in either up or down position. Available in 66" and 72" models.



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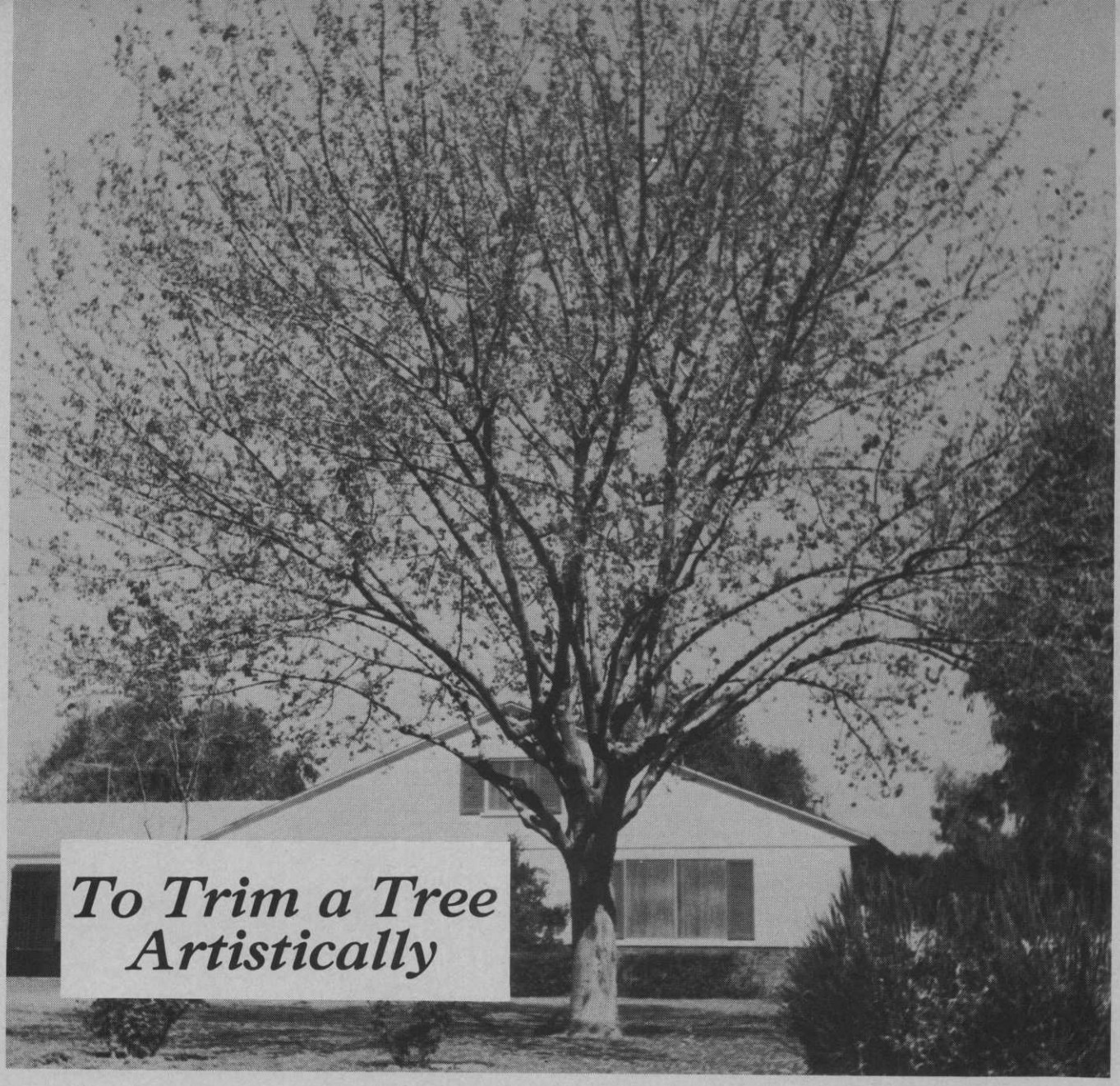

To Trim a Tree Artistically

EDITORS NOTE: William Johnson, owner of Badger Tree Service, Phoenix, Ariz, said in a recent issue that it's time to "put the care back into tree care." It is necessary, he said, for a good tree trimmer to have an "innate sense of tree artistry." But he believes a tree trimmer can be trained also to do an artistic job. Here are Johnson's 10 suggestions:

1. First study it for its own particular characteristics—or "personality." Observe the structural lines that bring out these traits in a way that enhances the home and property.

2. Check for limbs that may have particular aesthetic value. Plan these limbs into your overall design.

3. Determine which limbs might be lifted with proper cabling, rather than being removed because they appear too low.

4. Trim out the deadwood, suckers, crossing limbs, and so on.

5. Carefully thin the tree. Make all cuts neat and close to the branch so there is no stubbing, no rough knobs.

6. Trim unsightly limb extensions so tree outlines will be natural and pleasant looking.

7. Observe tree again from all angles. Is it lacy? Does it have the lines you intended? Is your client happy?

8. Finish tree by sealing all cuts with a good commercial tree wound dressing, preferably one that is penetrating.

9. Leave a clean yard.

10. At all times THINK SAFETY . . . WORK SAFELY.

the WISER winter izer

Most effective winter protection at lowest cost, WILT PRUF Anti-Transpirant prevents excess water-loss caused by drying winter winds. You can eliminate burlap windscreens. WILT PRUF saves shrubs, trees and roses all year round . . . from winter kill, summer scald, drought and city air pollution. Combats transplanting shock and extends the safe transplant season, too. *Write on your letterhead for 50-page technical manual of applications.*

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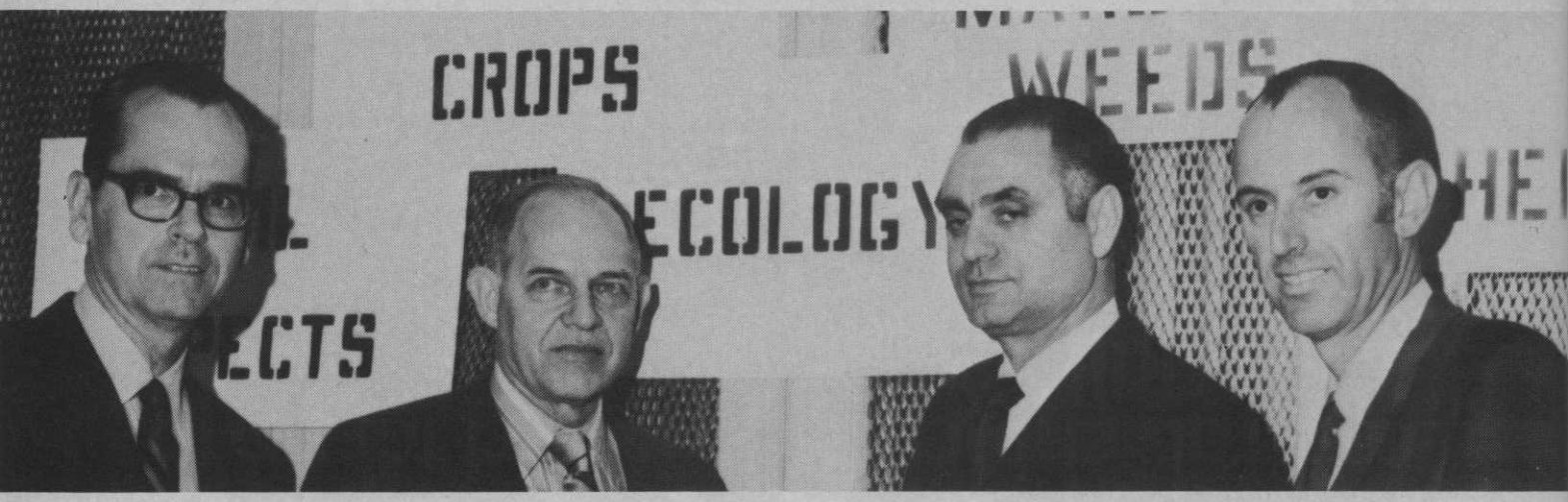

Background signs spell out the emphasis of the 11th meeting of the Weed Science Society recently in Dallas. Some 700 weed scientists attended. The men will provide the leadership for the coming year. From the left, they are Earl G. Rodgers, vice-president; Dayton L. Klingman, president; Phillip Upchurch, president-elect; and Paul W. Santelman, secretary.

WEED SCIENCE SOCIETY REPORTS

WHILE EXPRESSING "1,000% support" for improving the environment, the president of the National Agricultural Chemicals Association, called for a "switch from rhetoric to reason" in the regulation of environmental factors.

Parke C. Brinkley, addressing the 11th Weed Science Society of America meeting recently in Dallas, warned that without reason going into regulation of chemicals, "we could be trading one disaster for another."

Each issue should be decided as though "our entire existence and way of life depended on the right decision," he said, because each will have long lasting effects.

"Much of the rhetoric and emotion of recent months has tended to discredit the scientific community and the technology that has made this nation the envy of the rest of the world," he continued. This same expertise, he observed, offers the major hope for development and application of techniques for environmental improvement.

Several speakers expressed concern that the restrictive atmosphere at present regarding pesticides could bring on disaster. Dr. Dayton L. Klingman, incoming president of WSSA, predicted that without chemicals and other technology, another 300 million acres — an area equal to the key states of Missouri, Kansas, Arkansas, Tennessee, Louisiana Mississippi, and Alabama — would be needed to feed the U.S.

Dr. L. L. Danielson, outgoing WSSA president, said agricultural science is in trouble as the result of poor communications. "The public does not clearly understand its importance."

"We are living in a period when the public is exposed to a continual barrage of communications that creates a subconscious fear of almost everything," Dr. Danielson continued. "We are learning to fear food, water, air, transportation — even our fellow man."

To make matters even worse, he said, "communication between scientists is also poor. We find some segments of science attacking others in the public and scientific press without first attempting to reconcile their differences."

Some 700 weed scientists heard more than 225 technical papers covering virtually every aspect of weed control. While most papers were related to food production, several dozen pertained to control of vegetation in urban, industrial and aquatic areas.

Among resolutions, the Weed Science Society asked that weeds be "recognized as potential environmental hazards detrimental to the public health, welfare, and recreation, and that state, provincial, and federal funding of weed research be expanded."

Manufacturer Responsibility

Herbicide manufacturers have certain responsibilities to their customers, reminded F. A. Holmes of du Pont Company, in that herbicide users may overuse a new chemical or may have "idealistic expectations" on results. It is the responsibility of the manufacturer and his representative, Holmes said, to:

1. Have an adequate label on the uses for the product.

2. Know the strengths and weaknesses of the product so that result expectations are not oversold to the customer.

3. Provide sufficient information on the above in sales literature so the customer can make a sound decision whether to use the product. Many times this is the only guideline by which the customer can make a decision.

4. Only through proper information can a prospective user have the knowledge whether to use the chemical, what results can be expected, the possible negative results that may occur, and the overall effect of the use of the product on the crop, the user, and the environment.

5. A better environment is everybody's business and it depends in large part on adequate knowledge flowing from manufacturers and investigators to users.

Positive Pesticide Campaign

Walter Weber, technical director of pesticides for Indiana Farm Bureau Cooperative Association,

Inc., reported on a program to promote the idea that there is a "Safety Side in Every Pesticide." Four channels are being used.

A static set of about two dozen signs stressing affirmative viewpoints was furnished to county cooperative stores, vocational agriculture teachers and agricultural extension agents. These are to be used in county fairs, the state fair, and in similar situations.

A second project is the sponsorship of a statewide essay contest, "Protecting Our Environment Through Sensible Pesticide Use." There are five classes: (1) students up to and including the eighth grade; (2) high school students; (3) college students; (4) adult farmers; and (5) adult non-farmers.

A third project has been to prepare articles on the benefits of pesticides, and to answer the critics. This included letters to editors, radio and TV interviews, information for employees, and news articles.

A set of slides on the safety theme is the fourth project. These are used by farm chemical fieldmen at every available opportunity, showing them to church groups, youth groups, students, Farm Bureau meetings, garden club meetings, and service clubs such as Rotary, Lions, Kiwanis, Optimists, and so on.

Following are capsule summaries of some of the papers given on control of vegetation in the urban and non-crop areas.

Aquatic Weed Control

Irrigation water treated with acrolein controlled aquatic weeds and did not reduce yields of sugarbeets, soybeans or corn. In experiments at Prosser, Wash., acrolein was applied to crops at 0. 0.1, 0.6, and 15.0 parts per million in two-acre-inches of water by furrow and sprinkler irrigation. Furrow-irrigation treatments lasted one hour and 15 minutes, and the sprinkler treatments eight hours. — Victor F. Burns, USDA Agricultural Research Service, Beltsville, Md.

Diquat, endothall and 2,4-D do not translocate basipetally in Eurasian watermilfoil or hydrilla verticillata. The lack of basipetal translocation to reproductive structures buried in the hydrosoils may explain why regrowth occurs so readily after herbicide treatment. — Kerry K. Steward. USDA Agricultural Research Service, Fort Lauderdale, Fla.

Combinations of copper sulfate pentahydrate at 1.0 ppmw of copper plus diquat; paraquat; ametryne, atrazine; 2-tert-butylamine-4-(ethylamino)-6-(methylthio)-3-triazine; or 2,4-D increased the copper content of hydrilla when compared with plants which were treated with copper sulfate pentahydrate alone. The concentration of organic herbicide and contact time affected this increased uptake of copper. The addition of fenac, dichlobenil, diuron, the mono (N,N-dimethylalkylamino) salt of endothall, or dinitrophenol to this copper compound had no effect on copper uptake. Ametryne at 1.0 ppmw plus copper sulfate pentahydrate at 1.0 ppmw of copper exhibited a synergistic response on hydrilla as determined by dry weight and was associated with a high con-

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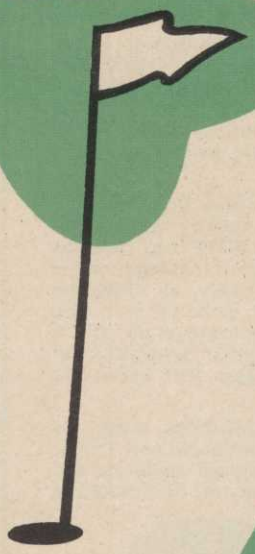

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centration of copper. Phosphorous levels of hydrilla were reduced by 0.1 and 1.0 ppmw of diquat and paraquat. Hydrilla treated with a combination of 0.1 ppmw of paraquat and copper sulfate pentahydrate at 1.0 ppmw of copper contained 0.34% less phosphorus than plants treated with paraquat alone. The phytotoxic effect of the herbicide combination on hydrilla may be due principally to an increased accumulation of copper and a reduction in phosphorous content.—David L. Sutton, R. D. Blackburn, K. K. Steward, University of Florida and USDA, Fort Lauderdale.

Presence of established sod-like growth of slender spikerush facilitated the non-use of herbicides for aquatic weed control in two canals and one reservoir in central California. Slender spikerush, a short growing rhizomous perennial, competes with certain rooted aquatic weeds, including sago pondweed, curlyleaf pondweed, American elodea, small pondweed, and horned pondweed. — R. R. Yeo, USDA-ARS an University of California, Davis.

Diquat and paraquat evaluated over a three-year period in 0.5 and .75 acre ponds had no effect on fish population. Ponds were treated with 1 ppmw once in a single year. — Robert D. Blackburn and Thomas M. Taylor, USDA-ARS, Fort Lauderdale, Fla.

Two methods of handling aquatic vegetation harvested mechanically have been studied at the University of Wisconsin. One is to fluidize by intensive chopping and grinding, reducing the vegetation to a slurry that can then be handled as a fluid. The other method is to mechanically dewater the vegetation by chopping and pressing. The fluid fraction is returned to the body of water while press residue is reduced to 12% to 16% of the original volume and 23% to 32% of its original weight. About 90% of the original solids, 85% of protein, 60% of the potassium, and 80% of the phosphorus present in the vegetation at harvest is removed in the press residue. — H. D. Bruhn and D. F. Livermore, University of Wisconsin.

Four to five beetles, Agasicles n. sp., per sq. ft. are needed to produce a noticeable effect on alligatorweed. The beetle will not completely eradicate the weed, but reduce it to a point where competitive plants can come in. It is highly unlikely the beetle will be effective for every area where alligatorweed grows. — Neal B. Spencer, USDA-ARS, Gainesville, Fla.

Herbicides on Turf

Kentucky bluegrass exhibited greater tolerance to bromacil than tall fescue or orchardgrass in Virginia tests. Plots were sprayed postemergence at ⅛, ¼ and ½ lb./acre Chlorosis and leaf tip die back of the three grasses appeared about 1½ weeks after application. At the ½-lb. rate, compared with control, clipping weights of bluegrass, tall fescue and orchardgrass were reduced 20%, 65% and 75%, respectively. Carbohydrates were reduced 15% in bluegrass, 48% in tall fescue and 51% in orchardgrass. Photosynthesis rate was reduced 33% in bluegrass, 57% in tall fescue and 71% in orchardgrass. — J. W. Shriver and S. W. Bingham, Virginia Polytechnic Institute.

Preemergence crabgrass herbicides have different effects on the vegetative development of bermudagrasses. Two-inch plugs of Tifton 328, Tifton 419, Tifdwarf and No Mow were treated in the field with granular applications of benefin (3 lb/a.), bensulide (12.5 lb./a), DCPA (12 lb./a), siduron (10 lb./a), nitralin (2 lb./a) and terbutol 12 lb./a). Plugs were removed from the soil about six and 12 weeks after application. One experiment was conducted each of three years, 1968-70. Significant differences from the check occurred only for normal and abnormal rooting at the nodes and stolon weight. Siduron most adversely affected top growth (stolon weight) of all four grasses. All herbicides greatly affected normal rooting of all grasses at the sixth week observation. Differences from the check were significant for No Mow, Tifdwarf, and Tifton 328. Normal rooting had increased at the 12th week observation. However, rooting was considerably less than the check. There was greater increase in rooting in the benefin treatment. — W. M. Lewis, North Carolina State University.

Brush Control

A new herbicide incorporation technique promises more effective control of woody plants that are known to be highly resistant to foliar-applied herbicides. USDA agronomist Everett B. Hollingsworth modified a standard root plow for subsurface placement of liquid chemicals. Called a Chem-Plow, the machine can place herbicides precisely where they'll be the most effective—in the soil at the roots, said Hollingsworth.

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Daniel C. Jaramillo, both USDA-ARS, at the New Mexico Agricultural Experiment Station. The machine was designed to apply herbicides to the root zone of saltcedar in the arid, low rainfall areas of the Southwest.

The blade of the plow is 8 feet long and two inches thick at the rear edge. A ½-inch pipe, fitted with five equally spaced spray nozzles, is welded to the rear edge of the blade. On the upper blade surface, protruding six inches to the rear and above the spray nozzles, is a sheet of ¼-inch metal. This "shield" supports and deflects soil, preventing interference with the spray pattern. A ½-inch supply pipe extends from the spray pipe up the rear of a vertical shank to the top of the plow frame where it connects to a power sprayer by a flexible hose. Herbicides may be applied at any depth to a maximum of 24 inches.

Creosotebush control with 2,4,5-T can be significantly improved by the inclusion of 50% dimethyl sulfoxide (DMSO) in the carrier. — USDA-ARS, Tucson, Arizona.

Response of creosotebush to aerially applied herbicide treatments — Applications were carried out the first week of September of 1964-67. Treatments included picloram at ½, 1, 1½ lb./a; dicamba at ½, 1 and 2 lb./a; 2,3,6-TBA at 1 and 2 lb./a; 2,4-D, dichlorprop and silvex at 2 lb./a; 2,4,5-T at 2 lb./a; and combinations of the above chemicals. Except for the treatment with 2,3,6-TBA at 2 lb./a, poor control resulted in 1964. In 1965, best control came with picloram at 1 and 1½ lb./a and with dicamba at 1 and 2 lb./a, the low and high rates of each herbicide killing 25% and 34%, respectively. In 1966, results with picloram were comparable to the 1965 results; picloram was not applied in 1967. In the dicamba plots, the kill at the ½, 1 and 2 lb./a rates was 4%, 25%, and 51% in 1966 and 9%, 35% and 61% in 1967, respectively. Average defoliation two years after treatment with dicamba at 2 lb./a was 80%. The 2,3,6-TBA at 2 lb./a was less effective than dicamba, giving 10-19% kill in the various years. Combination treatments of dicamba and 2,4,5-T at ½ lb./a each and 2,3,6-TBA plus 2,4,5-T at 1 lb./a each were slightly more effective than dicamba or 2,3,6-TBA alone at the same rates. — Walter L. Gould and C. H. Herbel, New Mexico State University and USDA-ARS.

In aerial brush control operations in western Texas, ½ lb. of 2,4,5-T ester/a in 4 gals. of a 1:3 oil-water emulsion gave an average kill of 22% on mesquite. Combinations of 2,4,5-T and picloram at ¼+¼ lb./a killed 42% of mesquite, 76% of Tasajillo and 41% of prickly pear. Equivalent rates of 2,4,5-T and dicamba killed 27% of mesquite, 65% of Tasajillo and 5% of prickly pear. In southern Texas, ½ lb./a of 2,4,5-T killed 24% of mesquite and 40% of guajillo, but did not give effective control of other species at rates up to 2 lbs./a. Picloram alone gave effective control of mesquite, prickly pear, blackbrush, granjeno, twisted acacia, whitebrush and guajillo at 1 lb./a. Highly effective control was obtained on all species except Texas persimmon at 2 lbs./a. Combinations of 2,4,5-T and picloram at ½+½ lb./a gave more effective control of most brush species than lower rates and were almost equally as effective control as higher rates, with the exception of whitebrush, lotebush and lime prickly ash. — Texas A & M University.

A year after treatment, silvex at 0.5 lb./a proved more effective in reducing the number of live sand shinnery oak stems than did dicamba, 2,4-D, 2,4,5-T or picloram at the same rate. Combinations of 2,4,5-T plus picloram or 2,4,5-T plus dicamba at 0.25 plus 0.25 lb./a were more effective than 0.5 lb./a of the herbicides applied singly. Silvex plus picloram at 0.25 plus 0.25 lb./a was more effective than 0.5 lb./a Silvex alone. — Texas A&M University.

Outgoing president L. L. Danielson, left, confers with incoming president Dayton L. Klingman concerning program agenda. The next WSSA meeting will be in February, 1962, in St. Louis, Mo. Local arrangements will be handled by Dr. Delbert D. Hemphill, professor of horticulture and project leader of the environmental health center, University of Missouri, Columbia.

Herbicide Application, Container Ornamentals

In one study, dichlobenil, nitralin, simazine, trifluraline and DCPA were compared in a 50% sand and 50% peat mix. Diochlobenil leached the greatest, simazine was intermediate, and nitralin, DCPA and trifluralin leached very little. DCPA, trifluralin and nitralin caused the least injury to a wide range of species whereas dichlobenil and simazine injured some species. Low rates of simazine in combination with trifluralin, nitralin or DCPA controlled a broad spectrum of weeds with very little or no injury to many ornamental species.

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This Kapok tree, thought to be the largest in the U.S., was recognized by the National Arborist Association at its its recent meeting in Tampa, Fla. But Richard Baumgardner recognized it as an outstanding specimen long before. He built a befitting eating place at its base. The Kapok Tree Inn has fed as many as 7,500 people in one evening. Three plaques, instead of one, have been ordered to appropriately recognize this specimen, whose trunk is an estimated 10 feet in diameter. Below, John Duling, right, who handled arrangements for the NAA presentation, talks with Mr. and Mrs. Baumgardner.

NAA Offering Non-Members

HOME STUDY COURSE ON ARBORICULTURE

A MAN WHO BUILT a fortune around a single tree and a multi-million-dollar garden, both of which attract tens of thousands of visitors every year, provided further dramatic evidence to members of the National Arborist Association that theirs is a profession held in high esteem and one that attracts a great deal of money.

As though in response to these expressions of high regard for trees and tree care, NAA members, meeting in February in Tampa, took actions indicating they're interested in taking the lead to improve the professionalism of arborists.

NAA, at its business meeting, de-

◀ For More Details on Preceding Page Circle (143) on Reply Card

cided to offer its home study program to non-members and to continue development of a tree fertilizer especially for members.

An extensive home study course in general arboriculture is available, and advanced courses are still being written. Details may be obtained by writing NAA headquarters, 2011 Eye St., N.W., Washington, D.C. 20006.

Subjects for a typical year's course include: customer relations, professionalism, the importance of quality work, tree moving, tree feeding, objectives of pruning, pruning standards, tree anatomy, spraying trees, dusting, and safety for tree workers.

Some 150 persons heard reports on business management, research, and brainstorming of practical problems. Entertainment highlights included visits to Busch Gardens and the Kapok Tree Inn.

Al Meserve, a Connecticut arborist, provided an interesting background note for this year's NAA tree plaque presentation. It is the practice of NAA to recognize, by means of a plaque, trees that are considered outstanding specimens and to encourage preservation of these trees.

On a trip to Florida more than a decade ago, Meserve recalled seeing a man driving a stake into the ground at the base of a big tree near Clearwater. His name was Richard Baumgardner. When told the man was staking out a restaurant, Meserve questioned the wisdom of locating "way out here in the country." Meserve declined to buy stock, though Baumgardner assured him his restaurant would be one of those "better mousetraps" to which people would flock to buy.

Today the Kapok Tree Inn is nationally famous and is practically indescribable in words. Though the Inn can seat 1,700 diners at a time, guests stand in line for hours. On a recent evening, the Inn fed 7,500 persons.

A special tour of NAA members visited the Inn to present a plaque to Mr. and Mrs. Baumgardner. The tree, estimated to have been planted in 1888, is thought to be the largest Kapok tree in the U. S.

Dr. Charles Lincoln of USDA's Delaware, Ohio, tree research laboratory, talked about the better mousetrap search for ways to control Dutch Elm Disease.

Work emphasis at present is on ways to attract the elm bark beetle away from elm trees and to seek parasites that would reduce beetle numbers.

Dutch Elm Disease already has killed 40% of the nation's elms, Dr. Lincoln said, and it continues to threaten an additional 400,000 trees each year.

Federal entomologists have found two chemical compounds uniquely present in the elm tree bark that serve as attractants. Additional research must explore several directions—developing the strains without the "scent"; masking the scent chemically; or developing an artificial scent to lure the beetles elsewhere.

Dr. Spencer H. Davis, Jr., of Rutgers University expressed high praise and offered graphic illustration for the effectiveness of the new fungicide, Benlate. He reported the results of usage on gray mold fungus, laurel leaf spot, hawthorne leafspot, and botrytis leafspot. Tersan 1991, he said, had shown excellent control of dollarspot.

NAA members split into groups to

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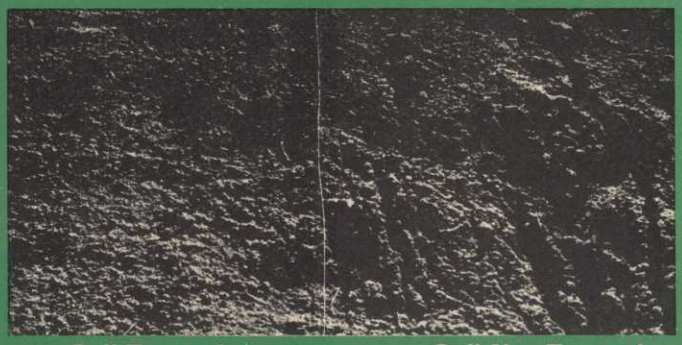

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Members themselves provided the subject matter for one morning's program. The audience divided into discussion groups. Leaders then reported the results of brainstorming four topics.

Here is the formal changing of the gavel to usher in next year's leadership. From the left, are: Treasurer — Robert Felix, Harder Services, Inc., Hempstead, N.Y.; new director— Boyd Haney, B. Haney & Sons, Franklin Park, Ill.; second vice-president — John A. Shullenbarger, Gustin Gardens, Gaithersburg, Md.; incoming president — William P. Lanphear, Forest City Tree Protection Co., Cleveland; outgoing president — William A. Rae, Frost and Higgins Co., Burlington, Mass.; secretary — W. Roland Shannon, Shannon Tree Co., Milford, Pa.; first vice-president — Glenn Burns, Karl Kuemmerling Associates, Inc., Canton, Ohio; and director— Thomas A. Morrison, arborist, Wilmetta, Ill. Director Paul Ramsey, N. G. Gilbert Corp., was absent.

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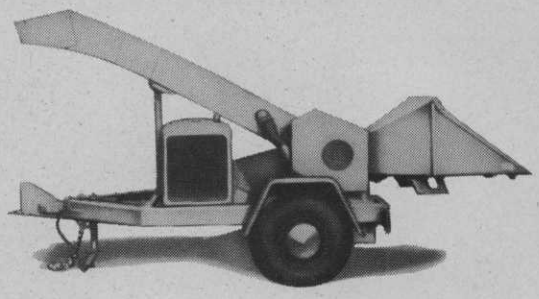

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brainstorm four subjects; customer contract provisions, recruiting and holding good employees, conglomerate affiliation, and specifications for an all-purpose commercial arborist truck body.

Here is a summary of comments.

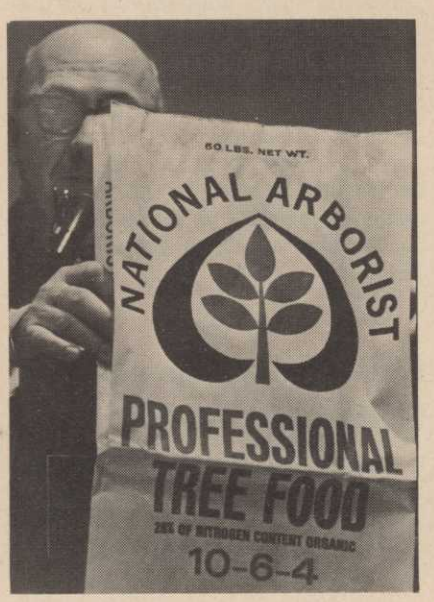
Customer contracts—"Get it in writing." Clearly describe your charges. Include provision for extra work. Have a policy on travel time, weather days, late payment, late work completion. "A well-written contract is a protection for both company and customer." Hold a field conference with customer. Make notes. Draw up a formal contract before work begins. Keep a day-to-day diary, sending a duplicate with billing. Be sure "guaranteed clauses" are understood. Charge for diagnostic work and drawings. Get full insurance coverage. Be sure client understands what you are talking about. Take before, during and after photographs. Make on-the-job inspections with the customer. Make specifications clear cut.

Recruiting and hold good employees—Talk with high school counselors to orient them on the opportunities in tree care work and seek their assistance in recruiting 18-year-olds. Offer retirement programs, hospitalization programs, guaranteed 40-hour week. Use bad weather days for training. Encourage use of the NAA home study program.

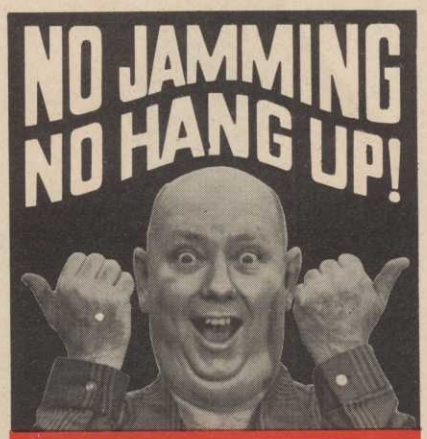
Conglomerate affiliation—An advantage is that the parent company is usually well-financed and can secure good equipment. A disadvantage is that your business could be sold out from under you. The group felt that while some companies might be looking for a tax loss, most would buy a tree company with good potential for long-term profit. The consensus was that there was no immediate danger of conglomerates taking over.

Specifications for an all-purpose arborist truck—This project appears to be a hopeless case at present. Laws are said to vary too much from state to state. Most companies design a truck to their particular specialty. For example, some do only spraying, some only trimming, some trimming and disposal, and so on. The group proposed that another equipment survey be taken. One arborist reported purchasing an equipment van. The vehicle afforded better storage and accessibility for tools, and in cold weather it was an ideal warm place for workers to eat when they're working in the field.

Safety awards were presented to three companies: Karl Kuemmerling Associates, Inc., Canton, Ohio, more than 100 employees; Chas. F. Irish Co., Inc., Warren, Mich., 25-100 employees; and Landscape Foresters, Ltd., Bronxville, N.Y., 25 employees or less.



Two kinds of tree food here. Dan Brogan, manager of professional sales for Agrico Chemical Co., holds up the bag for NAA professional tree food. While the program is going to be continued and expanded, economics limits the availability of the product to the eastern half of the U.S. But Mrs. H. C. Wilson's "tree food" is always available with just a little effort. Look closely for the tree design in this pound cake. Mix up two-third of the batter and pour into the cake pan, she said. Tint the remaining batter and pour it on top. Then pass a knife through the batter to form the trunk. It's very simple, said Mrs. Wilson, but she wouldn't guarantee what variety of tree you will get. That's the surprising part, she added.



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U.S. Plant Patent 2887

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Plant Growth Regulator May Work on Johnsongrass

Gibberellic acid, a natural growth regulator in plants, may offer a way to control Johnsongrass.

Dr. G. W. Burt, University of Maryland agronomy researcher, reported at the 25th meeting of the Northeastern Weed Science Society that large doses of gibberellic acid prevented flowering (thus seed production) in three varieties of Johnsongrass tested.

Smaller and economically practical doses also proved effective against a Johnsongrass selection from Mississippi, but failed to inhibit flowering in Johnsongrass selections from the "cool and intermediate" climates of western and southern Maryland.

Dr. Burt believes the acid may be a useful control agent for warm climates and that perhaps a way can be found to trigger the same effect in cooler regions, such as combining the acid with other chemicals.

IH Dealers Announce Rent-a-Rig System

International Harvester Company industrial equipment dealers now offer the International Rent-a-Rig System—a program that provides on a rental or lease basis the productive machines and services the user needs to make a profit.

Participating industrial equipment dealers in the Rent-a-Rig system program stock the most productive machines in their power classes, including the only under 70-hp crawler line with ¾, 1 and 1¼-yd. loaders that offer big rig features; loaders and backhoes to 93 hp; the swiftest and safest 30 bhp skid-steer loader; three standout 4,000 to 6,000-lb fork lifts; and the industry's most complete line of grounds maintenance machines.

Users, the company said, can rely on the International Rent-a-Rig System for dependable industrial equipment that will give them the top performance necessary to handle their jobs more profitably.

Heyser Landscaping Buys Portion of DeKalb Nurseries

Heyser Landscaping, Inc., of Norristown, Pa., has purchased the landscaping portion of DeKalb Nurseries, according to President William Heyser.

The purchase includes the equipment and unstarted contracts. Colonel Eugene Muller, former president of DeKalb Nurseries, will become a sales representative for Heyser Landscaping. The sales yard portion of DeKalb Nurseries had been leased previously to Gaudio's Garden Centers, a division of Penn Fruit.

DeKalb Nurseries had been in business since 1901 and was founded by Colonel Muller's father, Adolf Muller. Heyser Landscaping was founded by Ellsworth and Ruth Heyser in 1928. Both are still active in the business along with their sons, William and John.

Hahn Division Leaves Kearney-National, Inc.

Hahn Division of Kearney-National, Inc., formerly Hahn, Inc., has been re-acquired by former owners Jack and Lloyd Hahn.

All of the original Hahn assets, including the Hahn-West Point Division, primarily a manufacturer and distributor of equipment for maintenance of golf courses and similar large turf areas, were re-acquired by the Hahn brothers.

Also re-acquired was the Hahn-Eclipse Division, manufacturer of a complete lawn care implement line including lawn mowers, all-purpose tractors, rotary tillers, and snow throwers.

The third Hahn Division is the Hahn Agricultural Products Division, which grew from a barnyard farm sprayer producer to a firm which, at the time of the 1969 merger, had gross sales in excess of $16 million and employed more than 450 people.

Federal Entomologist Blesses Methoxychlor for DED

A safe, immediate and economical switch can be made from DDT to methoxychlor for Dutch elm disease control, according to recent Forest Service research findings.

Two years of field studies in Milwaukee, Wis., by Dr. Jack H. Barger, Forest Service entomologist, have demonstrated that spraying with methoxychlor either by helicopter or mist blower controlled the rate of disease incidence while the rate of disease incidence increased in the

Officers and trustees for 1971 of the Ohio Turfgrass Foundation are, from the left: Top row — Trustee, Bill King of Princeton City Schools; trustee, John Spodnik, Westfield CC, LeRoy; trustee, Ron Smith, horticulturist, Bowling Green State University; trustee, Jim Seigfried of Losantiville CC; trustee, Harry Shrode, J-M Trading Corp.; trustee, Paul Mechling of Sylvania CC; trustee, Fred Buscher, Ohio Agricultural Research and Development Center; trustee, Don Collins of Upper Lansdown Golf Links, Front row — Executive secretary, Robert Miller of Ohio State University; second vice-president, Paul Morgan, Browns Run CC, Middletown; past president, Dick Craig of Camargo Club, Cincinnati; president, Bob O'Brien, Century Toro; first vice-president, Gene Probasco, Lakeshore Equipment & Supply Co.; treasurer, Myron Gifford, Wee Bonnie Golf Course, Galloway; Trustee Max Szturm, Wildwood Golf Club, Middletown, was absent.

Winners of Ohio Turfgrass Foundation scholarships are, from the left: Larry Joe Goldsberry of Logan; Jeff Gray of Arcanum; Mike Rainey of Oxford; Thomas Vanden Eynden of Cincinnati; Ted Mochel of Lemont, Ill. With the award winners are Paul Mechling (third from the left) and Dr. Robert Miller (far right).

plots that were not sprayed. From 1969 to 1970, the average disease incidence decreased by 32% in the helicopter plots, decreased 34% in the mist blower plots and increased 94% in the untreated check plots.

Methoxychlor has been available for Dutch elm disease control for a number of years. Tests have demonstrated methoxychlor's biodegradability and safety to birds and wildlife, but its higher cost formerly made it less attractive than DDT for ground-level spraying with mist blowers. Helicopter application of methoxychlor at a low rate shows promise of matching the cost of former ground-level spraying with DDT, Dr. Barger reported.

These field studies have been substantiated by two years of laboratory bioassay research that demonstrates methoxychlor will effectively control the smaller European elm bark beetle when used as a fall or spring treatment applied by mist blower or helicopter. These bioassays also showed methoxychlor residues persisting for more than one year. This is considerably longer than previously reported.

Furthermore, these field studies demonstrate one-gallon of 12½% emulsion concentrate methoxychlor (½ pound actual) per tree applied in the spring by helicopter achieves the same result on rate of disease incidence in the field as was demonstrated with 2½ times as much methoxychlor applied at the same time by mist blower, Dr. Barger reported.

"Saturation treatment may not be essential for controlling disease incidence," says Dr. Barger. "We are continuing our field studies for a third year and hope to determine whether or not every elm tree in an area must be heavily sprayed to provide good protection against elm-bark beetle inoculation of Dutch elm disease."

Daconil 2787® fungicide helps you build a strong turf program. It checks leaf spot, dollar spot, brown patch and many other fungus diseases without harming your grass.

Daconil 2787 fungicide has been field tested world wide. It has shown high weather resistance. And moves to protect new growth between sprays. Always read the label before using.

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Virginia Turfgrass Council Discusses

THE TURF MANAGER AND THE ECOSYSTEM

B. K. Powers, left, of Roanoke, Va., is presented the R. D. Kake Memorial Award for outstanding service to the turf industry by Lee C. Dieter, president of the Virginia Turfgrass Council.

BE MORE KNOWLEDGEABLE, more public relations conscious, and especially more careful with pesticides than you have been.

That's the summarized advice given at the 11th Virginia Turfgrass Conference to fulfill the theme: The Turf Manager and the Ecosystem.

"You had better be more careful than you have been; you're more liable now," cautioned Arthur T. Hart, state department of agriculture, in discussing Virginia's new pesticide legislation. For example, he said, it is now "against the law" to misuse a pesticide, that is, to use it contrary to label directives.

All pesticides and their uses are currently under study, Hart said, with a report due by Dec. 15, 1971. Concerning the effect of findings on legislation in 1972, Hart predicted "more restriction on custom applicators and commercial users."

Several speakers referred to a massive knowledge gap that exists and contributes to the increasingly restrictive climate in which chemical users must operate.

Concerning information that is published, Dr. James O. Riggleman of DuPont observed that "We know what to believe, but the public doesn't."

A partial explanation, said Dr. W. H. Garman, vice-president of the National Plant Food Institute, is that "many people are not equipped to cope with statements about the environment, because they lack an understanding of chemistry and biology. Students aren't getting enough of this training."

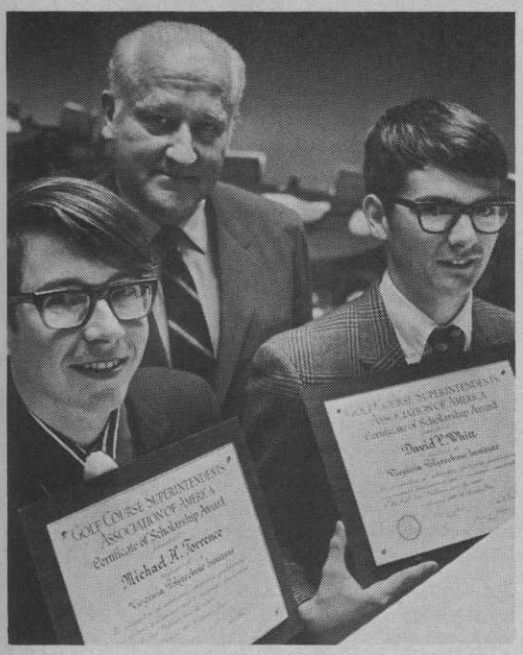
And many ecologists, he continued, "do not think about the practicality of their ideas. We just can't farm like our grandfathers. We wouldn't be here."

He called the League of Women Voters' campaign in Minneapolis futile effort in seeking to end the use of lawn fertilizers containing phosphates.

"No where will you appreciably change the effect of the phosphate content of water. Taking all of the phosphates out of detergents will not stop anything."

Even if a method were devised to take 95% of the phosphorus out of water, Dr. Garman said, the remaining 5% is enough to feed all the algae that would grow. Taking phos-

Virginia Turfgrass Council leadership for 1971 is, from front to rear: Lee C. Dieter, president; Jack Kidwell, vice-president; Earl O'Dell, secretary-treasurer; directors Richard Amidon, Paul Weeks, B. K. Powers, Sheldon Betterly, Jack Henry, William Mooney Harvey Carpenter, John Shoulders, Extension turf specialist, Virginia Polytechnic Institute; Dr. Richard Schmidt, associate professor of agronomy, VPI; and Dennis Brown, Division of Regulatory Service, Virginia Department of Agriculture. Amidon, Weeks and Henry are new directors.



Robert F. Shields, past president of the Golf Course Superintendents Association of America, presented GCSAA scholarships to Michael H. Torrence, left, of Appomattox and David P. Whitt of West Point.

phorus out of sewage isn't the answer, he contended. Taking out the organic carbons would help, he added, because as organic matter decomposes, it gives off carbon dioxide which is immediately taken up by living organisms.

A greater effort must be made to question the inaccuracies that reach the mass media, he continued. For example, the decline of fish catches in a lake may be blamed on pesticides or pollution, when in fact the real cause may be that the lake has been overfished. The sport fish population is down and the rough fish have taken over.

As unrealistic as some environmentalists get, they do serve a purpose, said Dr. R. E. Schmidt, agronomist at Virginia Polytechnic Institute, "in calling attention to such things as dirty waters."

Genesis does state that man should multiply and conquer, he continued, and that priority is given over all other life. But he added that man is also cast in the role of steward.

Though he described some environmentalists as "Prophets of Doom," Dr. Schmidt suggested that they "may rally us to perform our stewardship."

We can solve our problems one of two ways—in a destructive or creative way, he said. We can eliminate causes, that is, "we can eliminate people, or animals. But which people? Which animals?"

As a part of seeking creative solutions, Dr. Schmidt said the turf manager must realize that turf is an important entity in our sophisticated, modern society.

"As the work week shortens and recreation increases, turf's effect upon human social behavior will be greater. You have a new incentive—that of being a human ecologist."

Dr. Schmidt suggested five theories the turf manager should consider in selecting and managing turfgrasses: (1) tolerance; (2) limiting factors; (3) substitutes; (4) competitive stamina; and (5) natural selection.

Though attention seemed focused on pesticide regulation and on the effects of pesticides on the environment, reports of continuing research in other areas were presented.

Studies by agronomist Vince Snyder indicate that iron applications to turf can reduce dessication, increase rooting capacity, and increase top growth.

Though findings are significant, Snyder indicated more data must be obtained before the practice can be officially recommended.

Iron chelate at four ounces per 1,000 sq. ft. and one pound of nitrogen per 1,000 sq. ft. showed a marked improvement in turf color. Applications were made in October, November, December and February on Penncross Bent. Color response was noted within 24 hours, he said. It peaked in four to five days and lasted 1½ months. Spring growth came three to four weeks earlier, an effect he believes was produced by the heat aborption capacity of the turf's darker color. Although color was about the same in summer, Snyder found that nitrogen with iron increased root growth.

Dr. A. J. Powell of the University of Maryland accused turf men, of all people, for not taking seriously the old truism for seeking problem solutions: "Get to the grass roots."

Turf managers should be constantly checking the root system, "looking for thick, white, succulent, heavily branched roots."

"Just looking at top color can be misleading," he said. "We have to be able to sacrifice color in the summer time," he added, suggesting lighter fertilizer applications to avoid over-taxing the root system in stress periods. Among factors affecting root health, he listed: nutrients and soil pH, temperature, mowing height, moisture and light.

To improve the cold tolerance of bermudagrass, Dr. W. B. Gilbert, agronomist from North Carolina State, suggested adding potash in August. For example, he reported

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trials showing that whereas a 4-0-0 fertilizer ratio produced a 50% survival at 23 degrees, a 4-1-5 ratio gave a 50% survival at 17 degrees.

Other factors that affect cold tolerance, he said, include drainage, compaction, mowing height, and traffic. He strongly recommended a spring management practice of spiking, airifying and verticutting.

Mixtures are best when overseeding bermudagrass, Dr. Schmidt advised. Two seeding rates he recommended in pounds per 1,000 sq. ft. were: Pennlawn, 15, annual rye, 15 and Seaside bentgrass, 2; or Pennlawn, 15, and Manhattan, 15. A new variety, Pennfine, looks good also, he said.

The majority of irrigation equipment is basically good, reported John T. Singleton of Toro Manufacturing Co., "but the problems will come with the installation." The reason, he said, is that no one manufacturer offers a "total system." Pumping is the heart of the system, and that's a separate industry, he added.

You must have a good designer and he must see the course before he begins, said Singleton. Secondly, you must buy the best equipment; and thirdly, it must be installed properly. "There is no trade-in on a bad system."

"The more sophisticated a system, the greater the need for a service policy," he recommended.

We have come up with two new diseases for you to worry about, reported Dr. H. B. Couch. They are rhizoctonia leafspot on tall fescue and a new species of helminthosporium on Kentucky bluegrass. Controls of the latter disease aren't known because "we're not sure what it is yet." Most fungicides will control the new fescue disease.

Do you have turf areas that repeatedly are under stress? Look for these possible causes, suggested John Shoulders, VPI Extension turf specialist: temperature (northern or southern exposure), soil mixture (a good one, he said, is 45% mineral, 5% organic, 25% air and 25% water), turf variety, soil pH, fertility, thatch, and water management.

When replacing divots in an athletic field, Shoulders suggested digging two to three inches deep. Replacement sod can't be kicked out and it blends immediately with surrounding turf because it doesn't go through a stress period.

Leland H. Bull of State College, Pa., left, former state secretary of agriculture, was honored recently for his administration's statewide survey of turfgrass. Albert W. Wilson of Shawnee on Delaware, president of the Pennsylvania Turfgrass Council, presented the plaque. The study found that production and maintenance of turf was a leading industry.

In closing out the conference, attended by more than 300 turf specialists, Dr. R. E. Blaser, another VPI agronomist, warned that while the turf manager is "gravely misunderstood," the situation is "going to get worse." Only time may provide some of the answers regarding the improving of the environment, he said. In the meantime, the important goal of turf specialists must be to "keep growing professionally."

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A Public Service Announcement!

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DuPont Company Announces New Tersan Turf Fungicide

"Tersan" 1991 turf fungicide, a new lawn and turf disease-protection compound, is now available for control of three major turf diseases. Introduced by the Du Pont Company, the new fungicide is recommended for control of Rhizoctonia brown patch, Fusarium patch and Sclerotinia dollar spot.

The new compound has a combination of preventive and curative fungicidal properties, systemic action and a wide margin of safety.

"Tersan" 1991 will control large brown patch and Fusarium patch on tees and greens with as little as 2 ounces per 1000 square feet in sufficient water (2 to 5 gallons per 1000 square feet) to obtain thorough coverage. Applications may also be made to fairways if these diseases appear. Treatment should be started when disease first appears and repeated 10 to 14 days later, with added applications as needed.

Applications of "Tersan" 1991 with one ounce per 1000 square feet will control Sclerotinia dollar spot throughout the summer months. Golf course superintendents can start applications when disease appears and continue on a 14-day schedule. If brown patch appears, increase rate to two ounces. Circle (717) for more details.

Mallinckrodt Announces Broadleaf Herbicide

TREX-SAN (tm), a new broadleaf herbicide for the professional turf manager, has been annuonced by M. A. Eggleton, manager, Specialty Agricultural Products of Mallinckrodt Chemical Works.

TREX-SAN is a three-way combination of 2,4-D, MCPP and Dicamba. The additive effect of each is said to build a weed control system unequaled by its individual components or respective two-way combinations. Synergisms achieved enable the reduction of total amount of chemical required to obtain almost complete broadleaf weed control for 35 species. Safety factor is estimated to be five to ten times better than previous chemicals and combinations.

Features include effectiveness over broadest spectrum of weed control on the market; safety of use for most turfgrasses and adjacent ornamentals; economical, at $4.50 per acre at recommended rates; labor-saving in avoiding multiple applications. Circle (718) for more details.

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CAPACITY
THE BIG
NAME
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TURF

Officers and directors for 1971 of the Golf Course Superintendents Association of America are: Front row, from the left — Clifford Wagoner, secretary-treasurer; Richard Blake, president; Robert Mitchell, vice-president; and Norman Kramer, president emeritus. Back row — Directors Palmer Maples, Jr., R. W. Malpass, P. E. Mechling, C. G. Baskin, and J. Murphy.

42nd GCSAA Denver Conference

'GREATEST SHOW ON TURF'

Golf superintendents called their 42nd International Turfgrass Conference & Show the "Greatest Show on Turf." And they were quite likely right. The association of golf superintendents consistently stage the biggest exhibit of commercial turf equipment to be found. They have been playing regularly, at least for the last few years, to audiences of about 3,500, which indicates the dedicated interest in the commercial turf industry.

Richard C. Blake, superintendent of the Mount Pleasant Country Club at Boylston, Mass., is the incoming president. He succeeds Norman Kramer, Point O'Woods CC at Benton Harbor, Mich. Both are typical of the golf superintendent of today. As Blake said in his program appearance, the past 10 years has created a demand for qualified professionals in the industry. Blake said the superintendent needs to be both college-educated and business-oriented, plus having practical experience and knowledge. Further, he pointed out that men employed as superintendents generally have worked at several different golf courses. They have both the technical knowledge and the common-sense approach to successful turf management. In short, Blake said, they can do the job, as well as know why it is done.

Blake is convinced that superintendents generally have the knowledge and experience to do the technical job. But he expressed concern over what he termed "people problems." This so called people problem area is where help is needed, he said, and is needed now. An important function of the greens committee chairman, Blake believes, is to

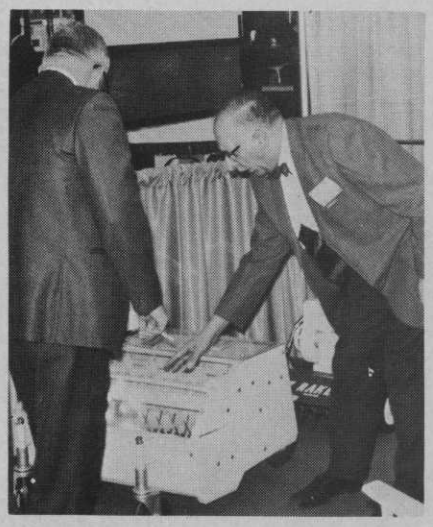
Table 1. Conference attendance continues high for the national turf conference staged by the GCSAA. Statistics for the past five years are as follows:

	Denver, Colorado (1971)	Houston, Texas (1970)	Miami Beach, Florida (1969)	San Francisco, California (1968)	Washington, D.C. (1967)
Members	1076	1182	1078	902	1066
Ladies	564	592	620	610	565
Guests	234	189	194	192	246
Greens Chairmen	214	211	506	90	110
One Day Admission	333	419	285	286	315
Turf Students	142	52	57	13	.....
Exhibitors	922	975	771	730	738
Total Registration	3485	3620	3511	2823	3040

Would you care to count noses to verify the crowd? If not, the table above will give the comparative size of this year's golf and turf show at Denver. Guests jammed the exhibit floor to see new products and equipment. At the Mallinckrodt booth, the subject was newly registered chemicals. And Russ Carlton, center, of Buckner was talking about sprinkler systems, of course.

J. L. Lewis, left, and M. M. McSwain, center, both of Myers, relay sprayer information to Carl Swanson.

Harold Skaggs, right, explains his new core shredder attachment to Dr. William Daniels, Purdue University agronomist.



Phil Abdinoor, E-Z Rake, with the aid of a "glass-paneled" model, describes to a visitor how the machine operates.

John Kielp, left, WEEDS TREES and TURF representative out of Chicago, talks shop with Roy Broyhill, president of Broyhill Co.

handle such problems — to keep balance and to effectively evaluate complaints. This chairmanship responsibility includes maintaining laison with the superintendent, the board of directors and the membership. Blake stated, that at many clubs, a large percentage of the membership does not know the superintendent.

Because of what may well be termed a communication gap, Blake believes that the greens or grounds committee chairman is one of the most important men at the club. Blake stated that he should serve as chairman for five years, and the man who succeeds him should have at least three years of experience on the committee. This adds up to an eight-year tour of duty. Without such, Blake implied that lack of continuity and lack of long range planning can exist and thereby add to the high cost of golf.

The 1971 exhibit and educational session was set up at the Currigan Hall Convention Complex at Denver, Colo. This complex, similar to that at Houston, Tex., last year, makes a major display of equipment easy for the convention delegate. Space is available, not only for the equipment but for the associated food concessions and conveniences so necessary for the businessman away from his office.

The 1972 show will be held at Cincinnati, Ohio, at a very similar convention complex. Show dates for the '72 Conference will be February 13-18. The Netherlands Hilton Hotel at Cincinnati will serve as the association's headquarters during the conference. Looking ahead, the Executive Committee named Boston, Mass,, as the conference city for 1973. The '73 Conference dates are Jan. 7-12.

Officers were elected as follows: Blake, president; Robert V. Mitchell, Sunset Country Club, St. Louis, Mo., vice-president; Charles G. Baskin, Jr., CC of Waterbury, Inc., Waterbury, Conn., director; Richard W. Malpass, Riverside G & CC, Portland, Ore., director; and Paul E. Mechling, Sylvania CC, Sylvania, Ohio, director.

In subsequent action, the Executive Committee appointed Clifford A. Wagoner, Del Rio Golf and Country Club, Modesto, Calif., as secretary-treasurer.

Other directors, whose terms of office continue through 1971 are: Palmer Maples, Jr., Charlotte, N.C., Jerry M. Murphy, St. Paul, Minn., and Norman W. Kramer, Benton Harbor, Mich. Kramer is outgoing president.

insect report

TURF INSECTS

A BILLBUG
(Sphenophorus venatus confluens)

OREGON: Damage heavy in 100-acre planting of Merion bluegrass in Linn County. Overwintering adults present in crown area. Field probably will be replanted.

RANGE CRANE FLY
(Tipula simplex)

CALIFORNIA: Infestation in Tulare County continues to damage additional areas. About 1,000 acres in Yokohl Valley show severe damage with many "slicks" on hillsides and extending into flatlands.

INSECTS OF ORNAMENTALS

A ROOT MEALYBUG
(Rhizoecus americanus)

FLORIDA: Adults on 1 out of 10 hibiscus plants at nursery near Osprey, Sarasota County. This is a new county and host record. All stages on roots of thread leaf falseralia *(Dizygotheca elegantissima)* at nursery near Large, Pinellas County.

BLACK VINE WEEVIL
(Brachyrhinus sulcatus)

OREGON: Infestations sporadic and heavy locally. Larval counts of 3-5 under some potted plants, feeding on roots of sedums and sempervivums in nursery at Dallas, Polk County. Some plant mortality. Controls recommended.

TREE INSECTS

WHITE PINE APHID
(Cinara strobi)

NORTH CAROLINA: Eggs heavy in Iredel County. Continues troublesome in western Piedmont and mountain areas.

A CICADA
(Diceroprocta vitripennis)

WISCONSIN: Specimen collected in mixed stand of cedar and hardwood at Spring Green, Sauk County. Range of this species extended 100-150 miles. This is a new state record.

OAK LEAFTIER
(Croesia albicomana)

WEST VIRGINIA: Eggs per 15-inch ranch of scarlet oak ranged 16-34 in Pocahontas County and 17-46 in Greenbrier County. Moderate to heavy defoliation expected in these areas.

AN ERIOPHYID MITE
(Aceria theospyri)

VIRGINIA: Specimen collected in persimmon in King and Queen County. This is a new state record.

AN ARMORED SCALE
(Lopholeucaspis japonica)

VIRGINIA: Specimen collected on European white birch in Independent City of Richmond. This is a new record.

OBSCURE SCALE
(Melanaspis obscura)

CALIFORNIA: Counts of 10 per linear foot on *Quercus agrifolia* (California live oak) in Capitol Park at Sacramento, Sacramento County. Adjacent area of scarlet and pin oaks currently under eradication treatment. *Q. agrifolia* is a new host record.

Cuts twice as fast as most lawn tractors, hugs the ground for hillside safety

NATIONAL 68-inch Triplex

Mows a 68-inch swath at speeds up to 4 miles per hour, a half acre in 15 minutes.

It's a turf-professional type mower, with three powered, free-floating reels that follow ground contour. It shears grass cleanly; doesn't leave unsightly "tip burn" as rotaries often do.

Reduces trimming time because the reels reach out over curbs, up to obstructions and in other hard-to-cut places.

Built to last—with Timken bearings, automotive-type transmission and a lip on the cutter bar to take years of wear.

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Other models from 25 to 84-inch cut.

Write for information.

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For More Details Circle (128) on Reply Card

Nearly 200 persons attended the first meeting of the National Landscape Association. The sign at right indicates the theme of the Mobile, Ala., get-together. NLA's new board is: Bottom row (left to right) — Treasurer, Richard Kaufman of J. Franklin Styer Nurseries, Concordville, Pa.; director-at-large, Art Lanseadel of Secor Landscape Co., Toledo, Ohio; president, Bill Heard of Heard Gardens, Des Moines, Ia.; vice-president, Jim McCarty of McCarty's Colonial Garden Center, Evansville, Ind. Regional directors in the top row are: Region VII — Arthur Fitzsimmons of Arthur Fitzsimmons Garden Centre, Hamilton, Ontario; Region IV — Donald Johnson of Johnson Nursery & Garden Center, Sioux Falls, S.D.; Region II — Tom Gilmore of Gilmore Plant & Bulb Co., Julian, N.C.; Region VI — Frank Tomlinson of Tomlinson's Select Nurseries, Whittier, Calif.; and Region V — Edward Teas of Teas Nursery Co., Bellaire, Texas.

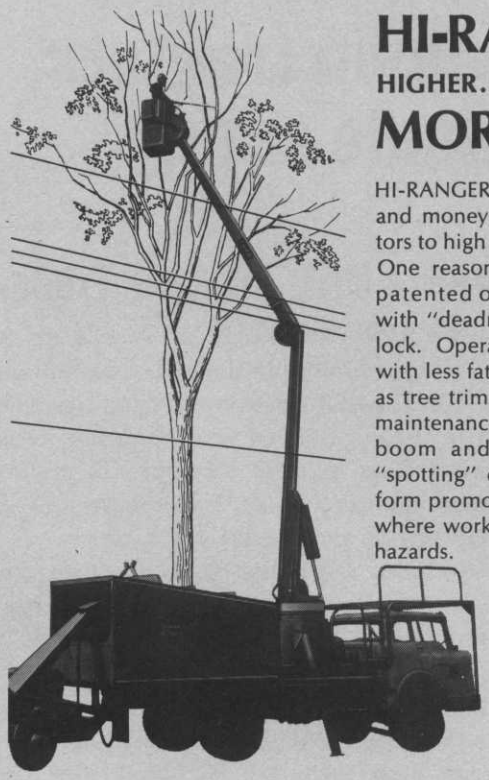
NLA Announces First Home Design Awards

The National Landscape Association has presented the first annual Residential Landscape Design Awards and Certificates of Merit.

Judges selected four first place awards and five projects for certificates of merit.

NLA's award program recognizes those professionals who have created outstanding residential landscape designs as well as those who execute those designs through landscape installation.

First place awards were presented to Bert T. Foster & Associates, and Tropical Arts, both of Orlando, Fla., for the design and landscaping of an Orlando residence; Garden Gate Landscaping, Silver Spring, Md., for a home in Potomac, Md.; M. Paul Friedberg & Associates, New York City, for the design of a residence in Southampton, N.Y., and Lewis & Valentine, Greenvale, N.Y. for the landscape installation of that residence; and Edward D. Stone, Jr. & Associates, in Fort Lauderdale, and Mike Blank Nurseries, Delray Beach, Fla., for a Delray Beach home.



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Benomyl for Fusarium Blight, Says MSU

Stop worrying about phosphate and nitrate pollution from fertilizing turf, or for having to live with Fusarium blight, but don't assume your turf worries are over because you decide to sod rather than seed.

These were some general recommendations coming out of two days of intensive discussions about turfgrass. The event was the 41st annual Michigan Turfgrass Conference at Michigan State University.

More than 400 golf course superintendents, sod growers, grounds managers, and other turf specialists attended.

"We have found a material, called benomyl, which will control Fusarium blight," reported Dr. Joseph M. Vargas of MSU's botany and plant pathology department. "Apply eight ounces of benomyl per 1,000 sq. ft. and thoroughly wash it down into the root zone before it has a chance to dry on the foliage," he directed.

Dr. Vargas said benomyl can be washed in by hand hosing or that it can be applied to the area covered by a sprinkler, allowing the sprinkler spray to wash it down. Two to five applications are required for control, he advised.

Benomyl is available under trade names by Du Pont and Scotts.

Use of phosphate and nitrate fertilizer on Michigan lawns does not contribute significantly to pollution of lakes and streams, contended Dr. Paul Rieke, MSU soil scientist.

Research at MSU and elsewhere has shown that phosphates are almost insoluble in soil and that, where care is used to follow recommendations for applications, there is no phosphate leaching.

Nitrate leaching, he said, is related to the type of nitrogen fertilizer used — water-soluble or organic—the rate of application at one time and over the season, and the amount of irrigation.

Dr. Rieke said that where turfgrass is being grown on heavily irrigated, sandy soils, especially near lakes and streams lighter and more frequent applications are required.

A visiting agronomist from the University of Arkansas cautioned that quality sod alone is not the answer to a beautiful turf.

"Proper seedbed preparation is just as crucial for the long-term success of sodded lawns as for seeded lawns," said Dr. John W. King. "And proper irrigation is the most important factor affecting the knitting of sod as well as the establishment of seedlings."

Dr. King, an MSU graduate, said proper debris removal, grading, drainage and soil texture are essential before sodding or seeding.

"Later correction is much more expensive than doing the job right in the first place," he emphasized.

Dr. King listed 12 lawn establishment principles, as important to the success of the home lawn as to the public green:

—Remove debris. Stones, roots, cement blocks and other debris interfere with water movement in the soil and result in dry spots.

—Rough grade the area. Slope at 2% to 5% away from buildings. ings.

—Install tile around foundations and through low areas. Pack backfill over tile so that settling will not occur later.

—Till or modify soil. Loam, sandy, clay loam, or sandy loam are best for lawns. Till to eight-inch depth.

—Fertilize and lime. Incorporate fertilizer, especially phosphorus, into top soil. Lime to pH 6.5.

—Final grade. The soil to receive the sod or seedlings should be smooth, fine and well-settled.

—Weed control. Use temporary soil sterilants to control quackgrass, nutsedge or bentgrass, if present. Keep sterilants away from tree and shrub roots.

—Seed or sod. Use high-quality seed blends or mixture high-quality sod.

—Roll lightly to assure contact of seed or sod with soil.

—Mulch with two tons of weed seed-free straw per acre if seeding.

—Irrigate. Use light water applications daily for the first month to keep soil moist, but not wet.

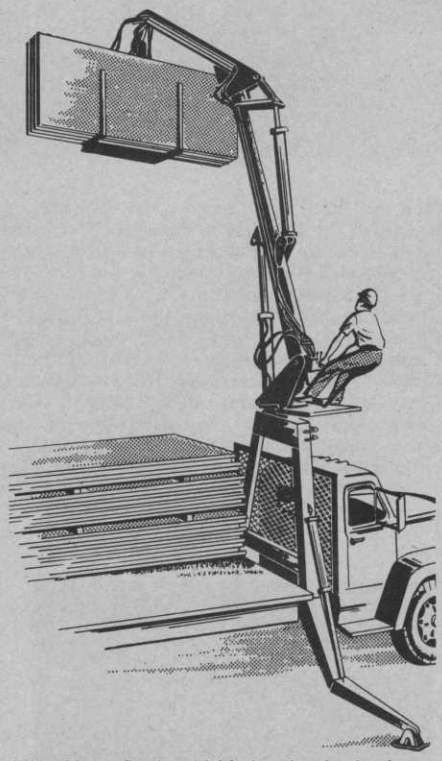
—Mow regularly as soon as any grass reaches one and one-half inches in height.

James Armstrong, J. D. Armstrong Landscape, Frazer, was elected president of the Michigan Turfgrass Association. Vice-president is Clem Wolfrom, Jr., Detroit Golf Club. The executive secretary-treasurer is James Standish III of Detroit. Dr. Paul Rieke of MSU is assistant secretary; Dr. Kenyon Payne of MSU, assistant treasurer.

Directors are Bill Milne of Gross Point Farms, Robert G. Spoelma of Spring Lake, James Smith of Detroit, Ted Woehrle of Birmingham, Gary Bartsch of Orchard Lake, Robert Knoll of Troy, and George Prieskorn of Brighton.

STICK 'EM UP!

NEW Dico Side-O-Matic Series K Unloader



The New Series K Unloader is the best "second story man" in operation. Third story too. Its boom and operator platform rotates 400 degrees, its fork rotates 450 degrees . . . so it can sneak materials up onto a building, through windows, doorways and between walls slick as a whistle. One man sees everything, does it all with fingertip control of the unloader's smooth hydraulic power. For gypsum wallboard, plywood, lumber, roofing, any material that can be packaged, palletized or lifted as a unit. Mounts behind the cab on any truck and permits full platform storage. For complete details, write today for Bulletin KBU.

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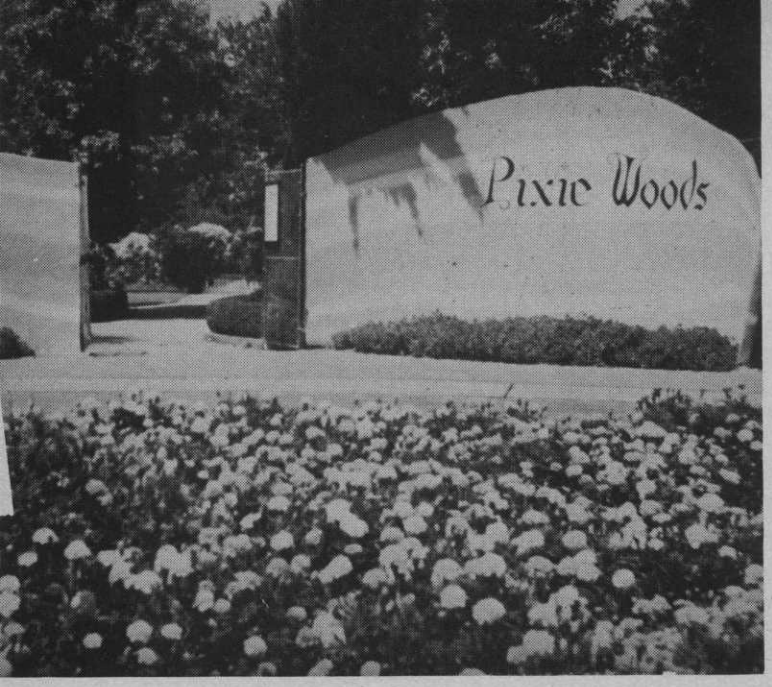

Five national winners in the annual Gold Medal Awards program for excellence in park and recreation management have been announced by the Sports Foundation, Inc. Presentations were made recently at the 42nd National Sportings Goods Association Convention and Show. Winners are: Class I (population more than 250,000) — Washington, D.C.; Class II (population 100,000-250,000) — Madison, Wis.; Class III (population 50,000-100,000) — Stockton, Calif.; Class IV (population 20,000-50,000) — Glenview, Ill.; and Class V (population under 20,000) — Lewiston, Idaho. Pictures above are of key elements of the Class III winning entry from Stockton. The city was noted for its Pixie Woods children's park, Silver Lake Family Camp and exemplary senior citizen's park. It was cited also for such items as its park storage building design for a new park and home development. The building was designed to blend in with the design of the neighborhood. Washington received the first state award for its parks and recreation program. Sound financing, far-sighted land acquisition, strong leadership, balanced but flexible programming, and over-all planning and cooperation with other agencies were key program criteria. Of special interest to judges was the degree to which the department succeeded in assessing and meeting the recreational needs and desires of the community.

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meeting dates

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Alabama-Northwest Florida Turfgrass Association spring meeting in Birmingham, Ala. Apr. 5 and 6.

Arizona Turfgrass Conference at the Holiday Inn North in Tucson. Apr. 6-7.

American Society of Consulting Arborists fifth annual meeting. Crystal City Marriott Motel, 1999 Jefferson-Davis Highway, Arlington, Va. Apr. 11-13.

National Golf Foundation annual meeting at the Summit Hotel, New York City, Apr. 22.

Florida Turf-Grass Trade Show at the Sarasota Motor Hotel, Sarasota. May 9-12.

Florida Nurserymen and Growers Association annual convention, Deauville Hotel in Miami Beach. May 13-15.

Southern California Turfgrass Institute at California Polytechnic Institute, Pomona. May 18-19.

Rutgers University Turfgrass Research Field Day at 10 a.m. at New Brunswick, N.J. June 8.

Grassland '71 fourth annual field day. Eugene, Ore., Municipal Airport. June 23-27.

California Landscape Contractors Association at King's Castle, Lake Tahoe. June 23-27.

1971 Midwest Nursery and Landscape Exposition at D. Hill Nursery, Dundee, Ill. July 25-27.

47th International Shade Tree Conference at the Queen Elizabeth Hilton Hotel in Montreal, Quebec, Canada. Aug. 8-12.

Penn State Turfgrass Field Day at the Joseph Valentine Turfgrass Research Center, University Park, Pa. Aug. 25-26.

Alabama-Northwest Florida annual turfgrass short course in cooperation with Auburn University, Auburn, Ala. Sept. 9-10.

Florida Turf-Grass Management Conference, Pier 66, Ft. Lauderdale. Sept. 19-22.

Midwest Regional Turf Foundation field day, Purdue University, Lafayette, Ind. Sept. 27.

30th Annual Short Course for Roadside Development, Columbus, Ohio. Oct. 4-8.

Society of Municipal Arborists seventh annual meeting at the Empress Motel, Asbury Park, N.J. Oct. 6-8.

Wisconsin Golf Turf Symposium at the Pfister Hotel, Milwaukee, Nov. 4-5.

Northeastern Weed Science Society 26th annual meeting at the Hotel Commodore in New York City. Jan. 5-7, 1972.

Ohio Chapter of the International Shade Tree Conference and the Ohio State University short course for arborists, turf managers, landscape contractors, garden center operators, nursery men, and others, at the Sheraton-Columbus Hotel, Columbus, Ohio. Jan. 23-27, 1972.

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Leading universities across the nation who are engaged in turf research rate A-10, A-20, and A-34 higher in disease resistance and performance than *any* other bluegrass currently under production.

When you become a grower of Warren's A-10, A-20, and A-34 bluegrasses, you will have a line of lawn grasses that out-perform all others and they will be exclusive with you in your market area.

Briefly, here's the story of these miracle bluegrasses. A-10 does well in hot humid climates. A-20 is resistant to all major grass diseases and A-34 tolerates up to 65% shade. A-10 is deep green in color and holds that color right through prolonged dry spells. A-20 greens up sooner in the spring and stays green longer in the fall. A-34 does equally well in full sun as it does in shade.

When you are a grower of Merion or other bluegrass strains, *you* have nothing more to offer than your competition has. With Warren's specialty grasses you set the pace and the price, because you have the finest lawn grasses yet developed, and that is not all:

Twenty-five to thirty new grasses, some out-performing A-10, A-20, and A-34 are on the way. All a result of Warren research.

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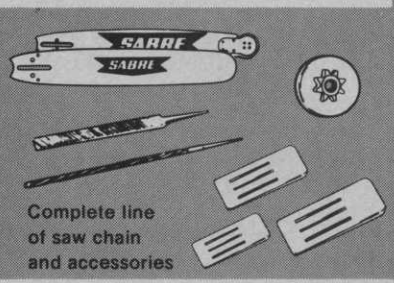

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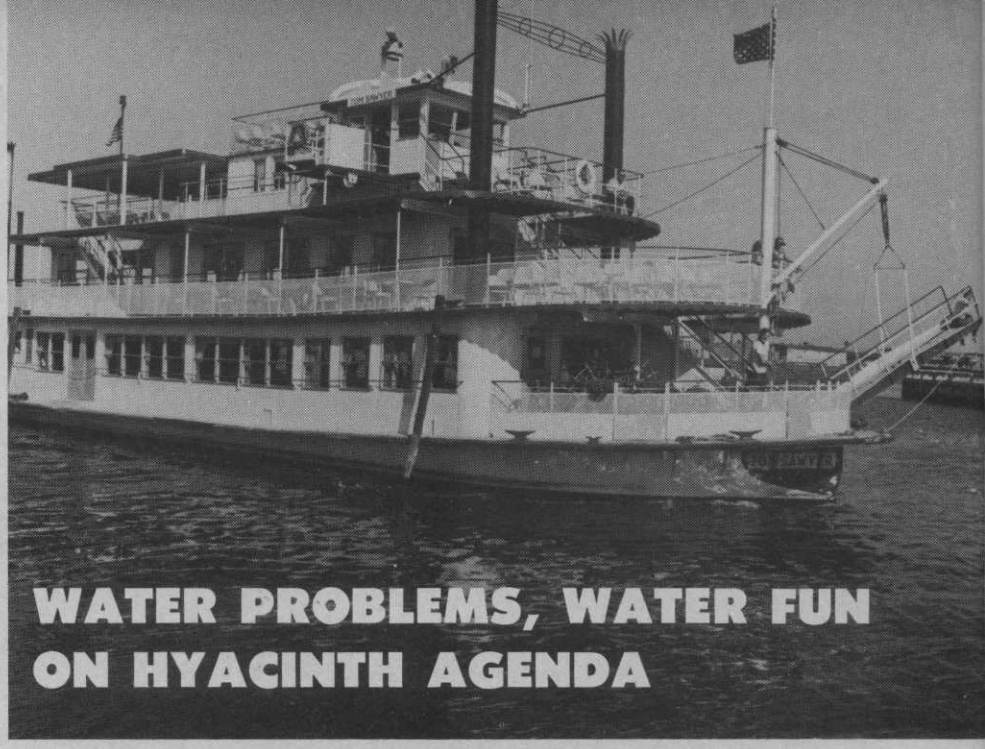


WATER PROBLEMS, WATER FUN ON HYACINTH AGENDA

Chartered for an evening cruise is the Tom Sawyer, a true riverboat.

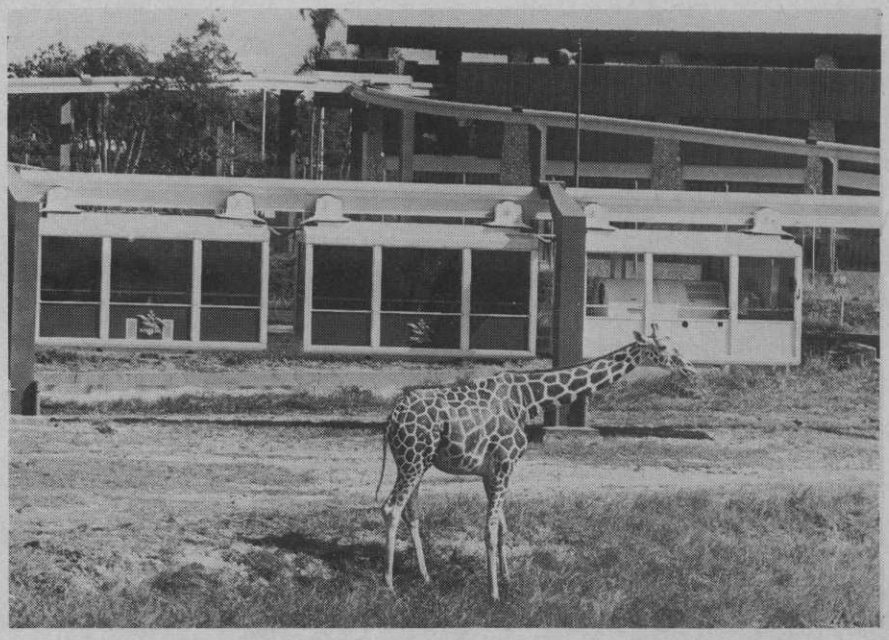
Aquatic weeds have become a national concern in the weed control industry. Yet only one organization — the Hyacinth Control Society — makes control of all noxious aquatic weeds its total program.

Founded in 1960, this specialized group of weed control specialists includes industry, educational, and government research, development, and sales members. The 1971 meeting promises to be the most sophisticated to date. It will be headquartered at the Manger Motor Inn, Tampa, Fla., July 11-14.

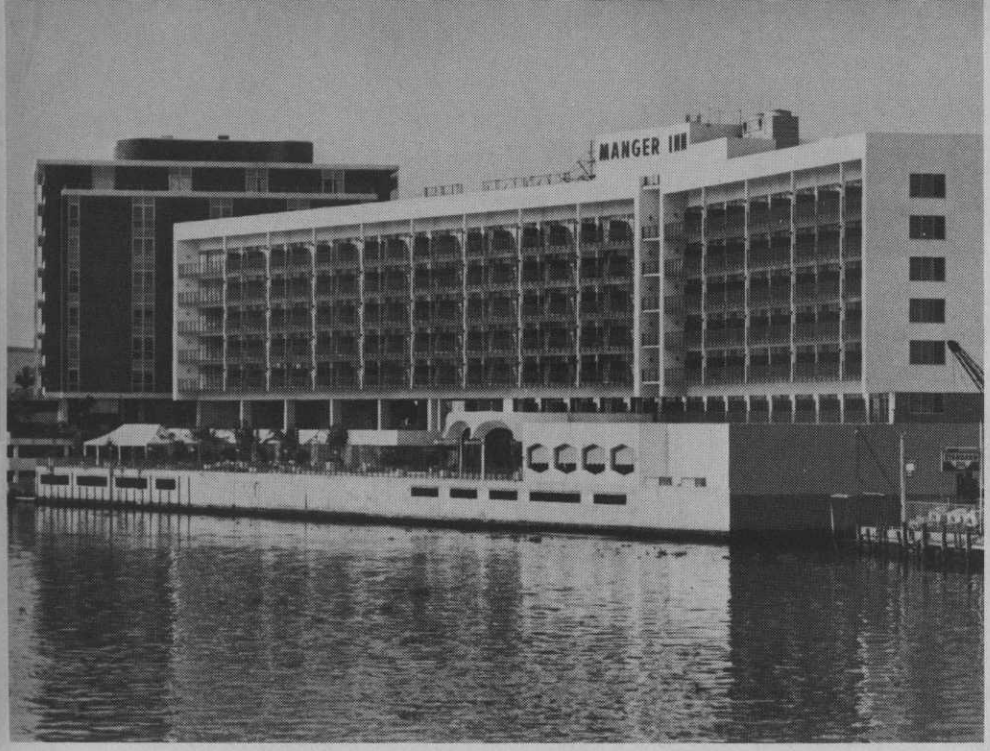
Efforts are being made by the group to see that anyone in the nation with a commercial concern for aquatic weed control be encouraged to attend.

Stanley Abramson, president of the group and associated with Southern Mill Creek Products Co., Inc., at Tampa (P.O. Box 1096), has a program developed which will combine both control procedures and research with practical application in a public climate where more and more restrictions are being demanded concerning pesticide use.

Family groups have long been a characteristic of this particular Society annual meeting and arrangements this year will include special programs for them. On the agenda for family and guests as well as members will be side trips to Busch Gardens, an evening on a true,



Another entertainment feature is a tour of world-famous Busch Gardens.



Headquarters for the annual Society sessions will be the Manger Inn, located on the riverfront.

chartered river boat, and the usual recreational features of the Tampa area.

Arrangements have been made for a reduced rate at the Manger Motel (200 Ashley Drive, Tampa, Fla. 33602). Convention rates will be $12 single and $17 double or twin. Reservations may be made direct with the hotel.

Meeting details are available directly from Abramson or Secretary Robert J. Gates (Box 508, Floral City, Fla. 32636).

Don't Forget the Sulphur For Turfgrass, Says Expert

For every five pounds of nitrogen applied to turfgrass, one pound of sulphur should be added, according to Dr. J. D. Beaton, Director of Agricultural Research of The Sulphur Institute. Writing in *The Sulphur Institute Journal,* Dr. Beaton stresses that high rates of nitrogen fertilization, a frequent practice in turfgrass management, greatly increase the need for sulphur. Unless sulphur is deliberately included in turfgrass fertilizer programs, serious growth deficiency may occur.

Pale green or yellow blades, particularly on the young growth, can be a symptom of inadequate sulphur. Since nitrogen and iron deficiencies have similar symptoms, plant analysis may be necessary for positive identification of sulphur deficiency, Dr. Beaton notes.

Research in Washington State, British Columbia, Florida and other locations have demonstrated that growth, color and density of turfgrass were improved with applications of sulphur, particularly when high levels of nitrogen fertilizer were used. The incidence of several turfgrass diseases was also reduced.

Haul your machines on a Miller **RAMP CHAMP** then put it to work

Two styles of RAMP CHAMPS in 2-axle or 3-axle models . . capacities to 18,000 pounds . . haul your equipment to the job, then tag-a-long to the nursery to earn its keep hauling big loads of stock, sod or other gear. Miller-engineered suspension gentles the ride, keeps b & b stock intact. Put muscle to work for more profit. Muscle from Miller. Write for FREE TRAILERING GUIDE.

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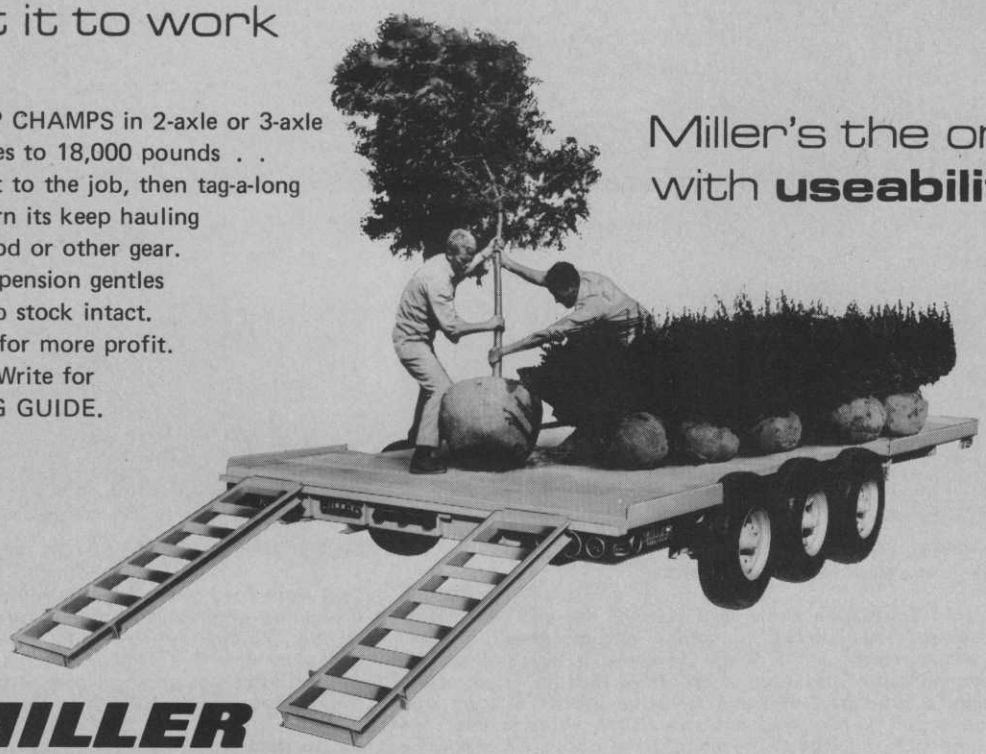

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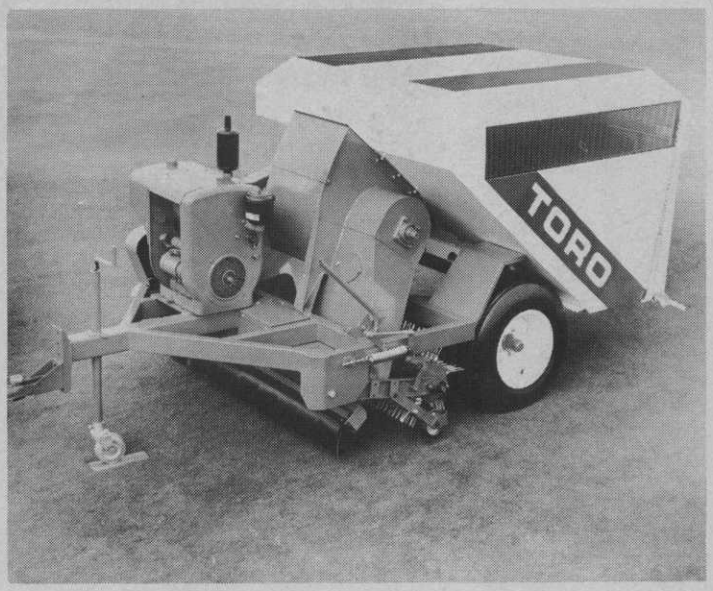


RAKE-O-VAC, Toro Manufacturing Corp., Minneapolis, Minn.

Toro has added the Rake-O-Vac to its line of turf equipment, acquiring the rights to the machine from Goodwin Equipment Service, Inc., of Manteca, Calif. The Rake-O-Vac picks up litter and debris from both soft and hard surfaces and includes a turf renovator. The machine has an 18-hp, two-cylinder gasoline engine that powers a 24-inch double inlet centrifugal vacuum fan and the reel units. With an empty weight of 2,060 lbs., it may be drawn by utility vehicle, tractor or light truck. Rake-O-Vac is said to be ideal for parks, golf courses, cemeteries, institutions, city streets, parking lots, school yards, stadiums and ball parks. For more details, circle (701) on the reply card.

NEW FERTILIZER PRODUCTS, Kaiser Agricultural Chemicals, Savannah, Ga.

Kaiser now offers a specially formulated line of landscape products for parks, football fields, recreational areas and golf courses. No. 101 is a 12-4-8 fertilizer, 80% organic nitrogen with 60% actual water insoluble nitrogen. No. 102 is 40% organic nitrogen fertilizer, 12-4-8, 30% actual water insoluble nitrogen. No. 103 is a general use, slow-release 38% nitrogen product. No. 104 is a turf fertilizer and weed killer, 12-4-8, with Balan herbicide for pre-emergence control of Poa annua and crabgrass. Kaiser offers free soil tests to determine the exact formulation needed. For more details, circle (702) on the reply card.

NEW FOUR-WHEEL DRIVE AND SMALL TRUCK, Suzuki Truck Importers, San Diego, Calif.

The new Suzuki Four-Drive Brute is a part of the L41 truck line. It uses the same two-cylinder, air-cooled engine and the same four-speed transmission as the truck; however it has a standard low-range transmission and four-wheel drive. Suzuki Truck offers twice as large a load bed as the Four-Drive (about 6′ long and 4′ wide) and a full ½-ton load capacity. Both vehicles are said to get excellent gas mileage — the Four Drive about 27 mpg; the truck, about 33 mpg. For more information, circle (705) on the reply card.

MORE "MUSCLE" IN TRACTOR, Waldon, Inc., Fairview, Okla.

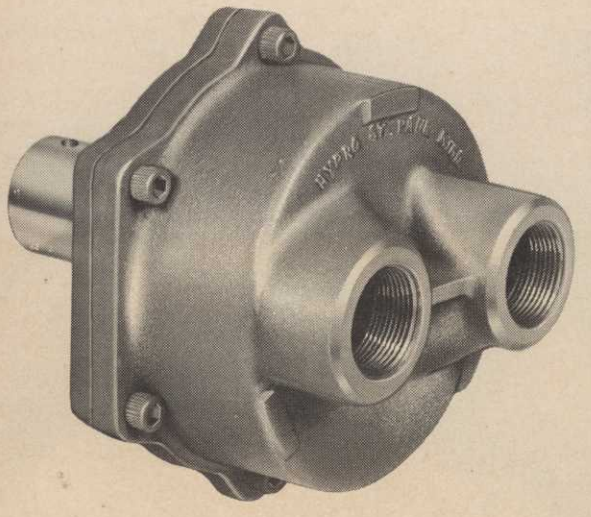
Two new Ford water-cooled engines and a new 65 hp Wisconsin air-cooled engine, plus a new gearbox, have added more muscle to the Waldon All-Hydraulic, four-wheel-drive tractor unit. This gives the unit five engine options, higher maximum travel speed, a new hood design, and a new balance advantage for use as a bucket loader or fork lift. Frequent requests for water-cooled engines brought the introduction of the Ford four-cylinder, in a 68 hp gasoline and in a 59 hp diesel. The new Wisconsin 65 hp option is added to the 37 hp Wisconsin and a 48 hp Deutz diesel, both air-cooled. For more details, circle (706) on the reply card.

FRONT RUNNER MAINTENANCE VEHICLE, Hesston Corporation, Hesston, Kans.

Front Runner, Hesston's new entry in the lawn and garden field, is called the first ground maintenance vehicle ever designed especially for the job. More than just a miniature farm tractor, Front Runner is articulated (hinged in the middle) and has a front-mounted mower that cuts grass before the machine runs over it. Hesston offers a complete line of attachments for the machine, including a self-contained vacuum collector that mounts in its own carry-all instead of being pulled behind on a special cart. Front Runner is a 14 hp machine with a top speed of 11 mph. For details, circle (703) on the reply card.

NEW PRODUCTS FOR SOD FARMS, O. M. Scotts & Sons.

Three new ProTurf products have been introduced for use in sod fields. They will be sold to sod growers throughout the U.S. through Scotts ProTurf Division. ProTurf Fairway fertilizer is a 30-3-10 controlled-release Polyform fertilizer, non-burning, has no chloride-containing salts, and is a ready-to-use granular product. ProTurf Nitrogen-Potassium contains no phosphorus and is designed for Poa annua control programs or wherever phosphorus is not required. Analysis is 32-0-8. ProTurf Fertilizer with DSB Fungicide has been developed to control and prevent Dollar Spot and Brown Patch. The systemic non-mercurial fungicide provides long residual disease benefits. The fertilizer analysis is 28-5-3. For more details, circle (704) on the reply card.

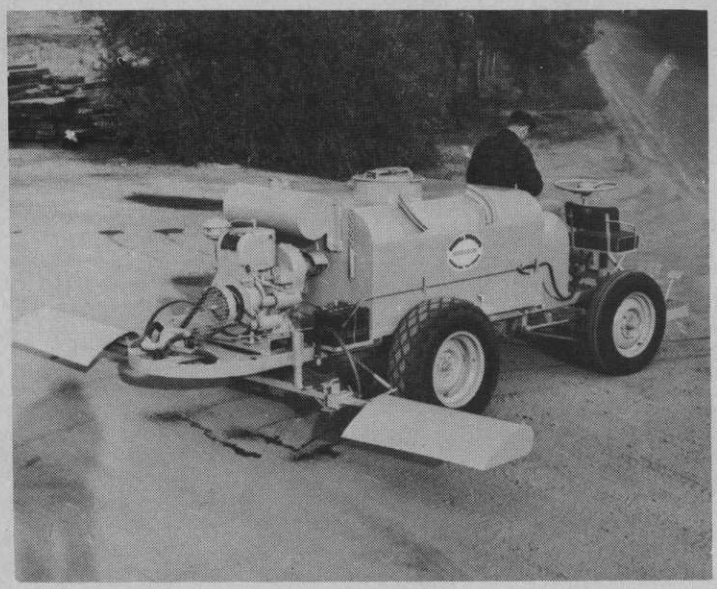


NEW ROLLER PUMP, Hypro Division, Lear Siegler, St. Paul, Minn.

A new end-ported Series 8500 roller pump for spraying weed killers, insecticides and liquid fertilizers has been announced. It delivers a maximum of 28½ gpm at 600 rpm and 0 pressure with a delivery of 23 gpm at 540 rpm and 30 pounds pressure. The new pump features a unique rotor design engineered to pump powder suspensions and other similar liquids more efficiently. Rollers never pass over openings or portings, thus increasing roller life and improving over-all performance. Weighs about 28 lbs. For more details, circle (707) on the reply card.

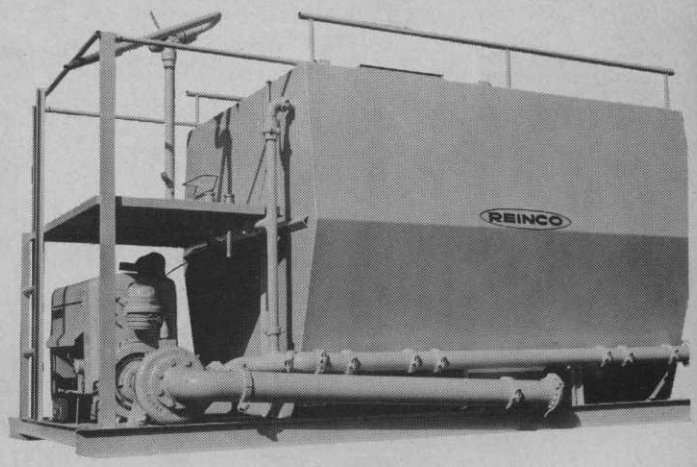
NEW FLAIL MOWER, Engler Mfg. Corp., Houston, Tex.

Available in both 72" and 90" models, the new Terrain King flail mower features exclusive "quick change" knives, reversed or replaced with a "twist of the wrist," says R. R. Wright, president of the company. Blades are removed readily by hand, without special tools or delays. Both lift and pull-types are available. The balanced shaft minimizes vibration. The drive line, belt and shaft are fully shielded for safety, and a rear safety flap is standard equipment. Optional on pull-type models are 6x9 notat wheels. For more details, circle (708) on the reply card.



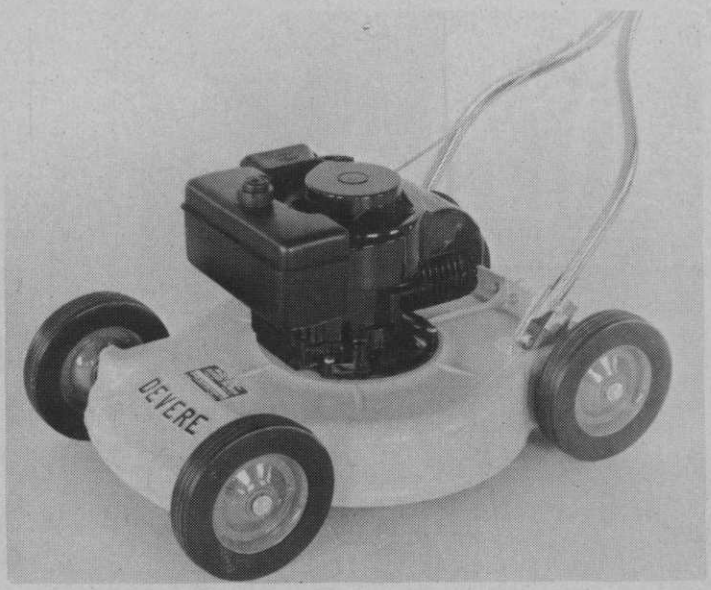
SELF-PROPELLED WEED SPRAYER, Randell Mfg. Co.,

This nearly new system can be operated from either side by one man. A hand gun on each side, a center boom and two wing booms make it possible to direct spray to inaccessible places. The booms can spray a 16′ swath, and have a break-away features that allows them to bounce away from obstructions and return to their original position automatically. On uneven terrain, the Randall Self-propelled unit gives complete and even coverage and is capable of speeds up to 15 mph. Four basic models range from 9 to 30 hp, with either front or rear mounted engines, four-wheel-drive, and various drive options. Randell sprayers are shipped ready for use. For details, circle (709) on the reply card.



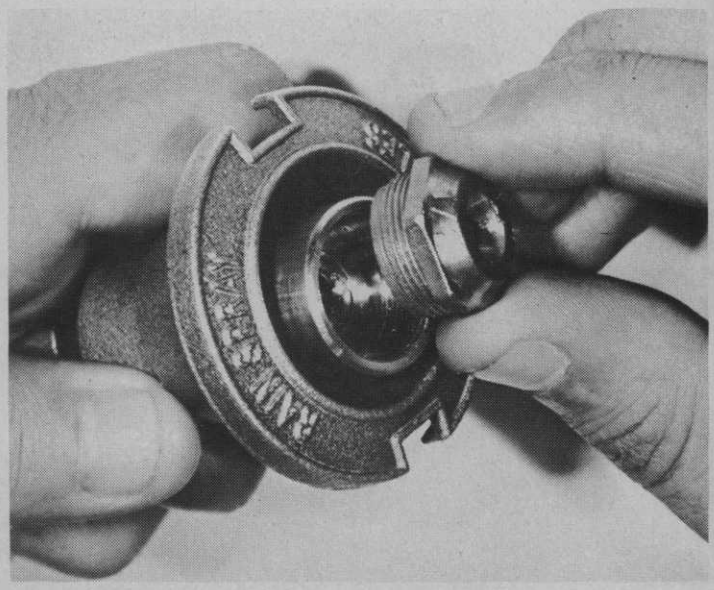
NEW HYDROGRASSING UNIT, Reinco, Inc., Plainfield, N.J.

Reinco's new 2,500-gal. working capacity Hydrograsser incorporates the exclusive all-hydraulic jet agitation mixing system. Power is supplied from a six-cylinder 200 C.I.D. water-cooled engine, developing 151 gross hp at 2800 rpm. The pump is an all iron straight centrifugal type with ⅞″ particle size clearance. It is stated that a spray range of 200′ from the spray platform can be expected. The hydraulically balanced spray return loop attached to the spray boom allows quick coupling of long and medium range, and fan pattern, all cast iron spray nozzles. For more details, circle (710) on the reply card.



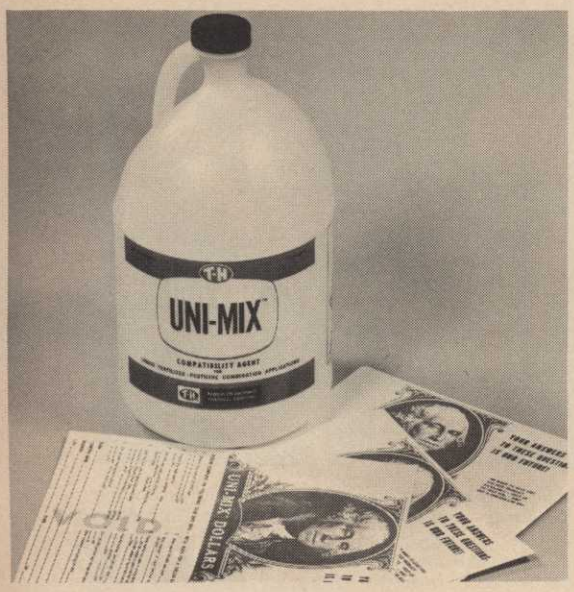
TRIMMING MOWER, Devere Mfg. Co., Racine, Wis.

Devere has announced an 18″ heavy duty trimming type rotary mower designed especially for commercial users, such as golf courses, parks and schools. Powered by a 3½ hp engine, the unit can trim on either side close to trees, walls, and other stationary objects, thus eliminating much time consuming hand trimming and the inconvenience of one-side only trimming. Cutting heights are from 1″ to 3″ in ¾″ increments. Optional equipment includes a 5½ qt. tank. For details, circle (713) on the reply card.



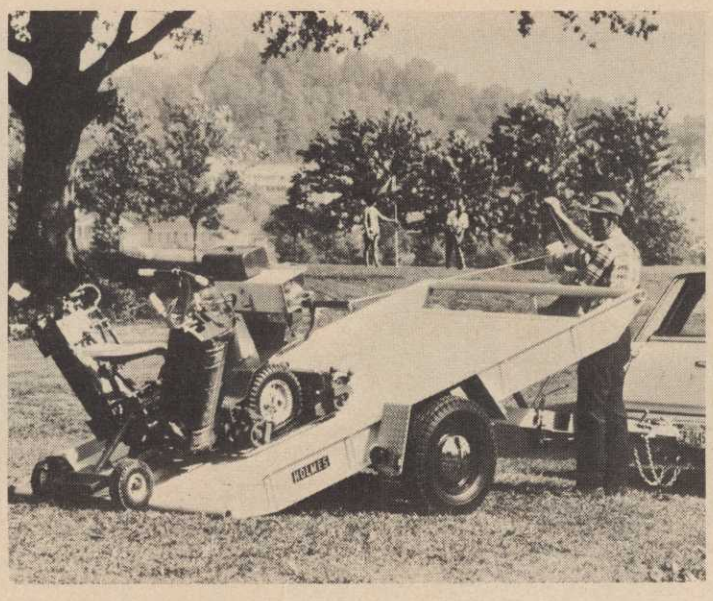
BRASS NOZZLE INSERTS, The Leisure Group, Inc., Los Angeles, Calif.

Thompson has added four corrosion-resistant brass nozzle inserts to its 1971 line of Rain Spray underground sprinkler heads. The new brass inserts, and companion Delrin Plastic inserts, come in four spraying patterns from a quarter-circle to a full-circle. They are interchangeable in all Rain Spray underground heads, except the bubbler head and those made of molded polypropylene plastic. Rain Spray underground sprinklers are available in brass, zinc or polypropylene standard heads; brass or polypropylene pop-up heads; a brass shrubbery and ground cover head; and a brass bubbler head. For more details, circle (714) on the reply card.



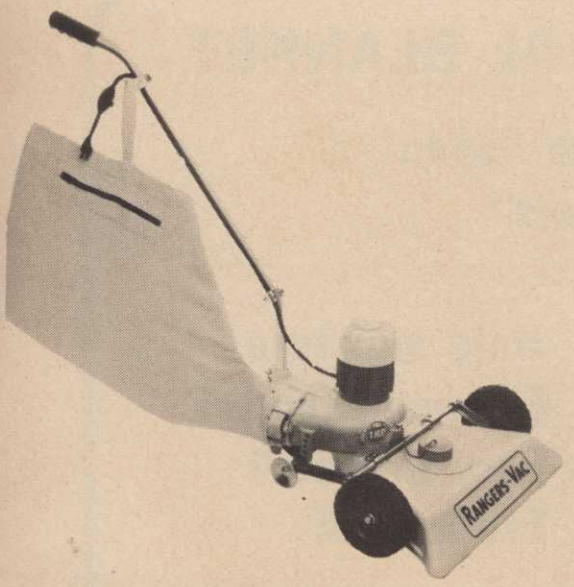
COMPATIBILITY AGENT, Thompson-Hayward Chemical Co., Kansas City, Kans.

UNI-MIX is a tank mix additive which aids in keeping pesticides uniformly mixed with liquid fertilizers during field application. It is said to be effective in increasing the compatibility of pesticides not specially formulated for simultaneous applications with liquid fertilizers. UNI-MIX can be used in a variety of fertilizer-pesticide combinations. The product is packaged in the new "no-glug" one gallon jug, four to a case. For more details, circle (711) on the reply card.



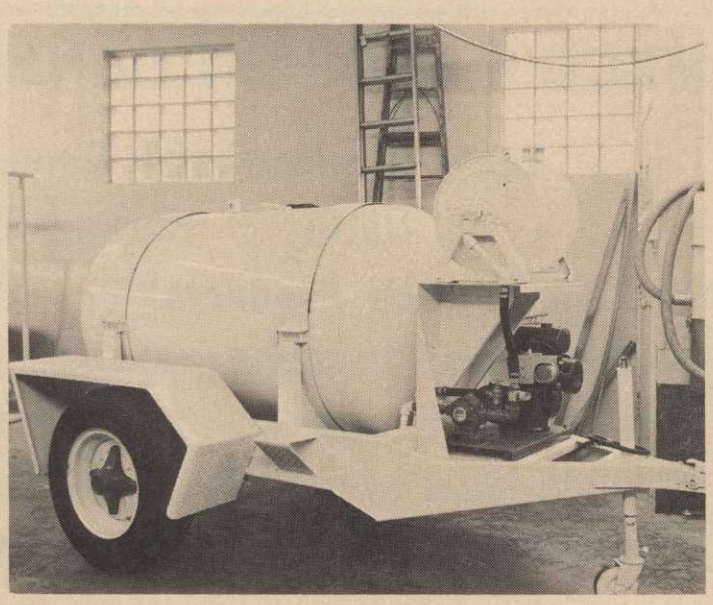
TILTING BED TRAILERS, Ernest Holmes Co., Chattanooga, Tenn.

A full line of heavy industrial-type, tilting-bed trailers has been introduced, consisting of five models, ranging in hauling capacities from 4,000 to 16,000 pounds, making them suitable for transporting such equipment as gang mowers, wheel tractors, backhoes, and small dozers. The bed can be tilted by a few strokes on a hydraulic jack provided for this purpose. Tilting and loading requires only one man. Depending on the size capacity, Holmes tilting-bed trailers have a spring-mounted, two-wheel, single axle or an eight-wheel, spring-mounted walking beam suspension. For more details, circle (712) on the reply card.



LIGHTWEIGHT ELECTRIC VACUUM, Rangers Die Casting Co., Lynwood, Calif.

Rangers Model #2098 all-purpose electric vacuum is designed for lawns, driveways, garages, workshops, playrooms, factories, stores, office buildings and parking lots. It picks up leaves, twigs, grass, weeds, small stones, common trash and litter. The #2098 Vac has a 1.1 hp burn-out-proof electric ball bearing motor. Vacuum weighs 26 pounds. Bag capacity is about two bushels. For more details, circle (715) on the reply card.



TRAILER SPRAY UNIT, Lewis Equipment Co., Muncie, Ind.

These units are available with most any type pump and engine combination that a customer would want. They also can be equipped with mechanical agitation for using wettable powders. Trailer has electric brakes, the tank is 300-gal. capacity with two baffles and gauge, pump is 7500 Hypro, engine is 4 hp Kohler cast iron block, hose reel is ½" 200 ft. long, and tires 215-14-4 ply. For more details, circle (716) on the reply card.

Texas Turfgrass Association has honored these men for service to the turfgrass industry and for another unusual and important achievement. Each have attended all 25 conferences of the turfgrass association. They are, from the left, Charles Gregory, Goldthwaite's, Fort Worth; L. W. "Sonny" DuBose, Jr., superintendent of the Houston Country Club; and Albert W. Crain, Goldthwaite's, Houston. Gregory is serving another term as regional director; DuBose has served several terms as regional director and as vice-president and president. Crain has been editor of the Turf News of Texas some 16 years.

Texas A&M University has received a grant-in-aid from the O. J. Noer Research Foundation. Foundation member Howard Goldthwaite, right, presents the $4,000 check to Associate Dean of Agriculture Richard C. Potts. The annual grant was made for an in-depth study of thatch in turfgrasses. Noer grants are made from earnings on invested principal. Donations provide funds for turfgrass research in perpetuity. Anyone wishing to contribute to this tax deductible organization should send checks to: The O. J. Noer Research Foundation, Frank Shuman, 1528-32 Belfield Ave., Philadelphia, Pa. 19141.

New Algicide Receives USDA Registration

Applied Biochemists, Inc., Milwaukee, Wis., has been assigned U.S. Department of Agriculture Registration No. 8959-2 for SWIMTRINE, a swimming pool algicide.

SWIMTRINE is a chelated copper compound which controls algae without precipitation. It is non-clouding, non-clogging and requires no waiting period for use of the pool following treatment. The company also manufactures CUTRINE, an algicide for lakes and ponds. Distributorships are available. For details, circle (720) on the reply card.

AMXCO'S EROSION CONTROL BLANKET

Locks in place with Genuine Aspen "Curlex"* Barbed fibers.

AMXCO'S Erosion Products.

- Keep the soil in place
- Promote turf growth
- Provide ideal growing conditions
- Hold moisture
- Eliminate rework
- Easy to install
- Economical

AMXCO'S Erosion Control Blankets provide an effective, low-cost method for preventing wind and water soil erosion on steep slopes, road shoulders, median strips, bridge embankments, drainage ditches, ski slopes, waterways, dam sites, water sheds, levees and landscape improvement projects.

*"Curlex" Aspen fibers expand when wet and force the barbed ends into the soil. This provides maximum holding ability under all weather conditions and assures the promotion of better turf growth.

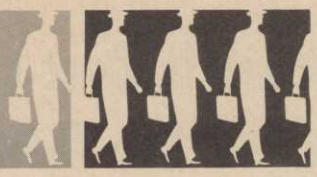
For information on AMXCO'S full-line of erosion control and turf growth products write dept. WTT-2 AMXCO, P. O. Box 5067, Arlington, Texas 76011.

amxco

AMERICAN EXCELSIOR COMPANY

For More Details Circle (144) on Reply Card

industry people on the move



IOWA AERIAL APPLICATORS ASSOCIATION announces these new officers for 1971: President — Lester Theobald of Mapleton; vice-president — Merrill Johnson of Pacific Junction; secretary-treasurer — Vernon Orr of Whiting; NAAA director — Paul Hursh. Committee chairmen are: Nominating — Dale Shelly; program — Elmer Steier; public relations, Leo Sterk; and legislative, Paul Hursh.

* * *

JOHN M. MARTIN has succeeded retiring HENRY A. THOURON as chairman of the board of Hercules, Inc., Wilmington, Del.

* * *

ROBERT F. LEDERER, executive vice-president of the American Association of Nurserymen, has been elected chairman of the Washington Youth Gardens Council, succeeding Mrs. Orville L. Freeman, wife of the former U.S. Secretary of Agriculture.

* * *

DENNIS M. DUNBAR has joined the entomology staff of the Connecticut Agricultural Experiment Station, New Haven, to work on methods of controlling the gypsy moth.

* * *

HUGH M. LYNN has joined Thompson-Hayward Chemical Co., Kansas City, Kans., as product manager of fumigation products.

* * *

DR. GIRTS KAUGARS has been promoted to research head for the insecticide research unit of TUCO, Division of Upjohn Co., Kalamazoo, Mich.

* * *

$300 SCHOLARSHIPS from the Golf Course Superintendents Association of America have been awarded to: Carl J. Rasnic, Jr., of Beltsville, Md.; Jerry J. Gould of Edgewater, Md.; Harvey B. Wilson, Jr., of College Park, Md.; and Michael J. Larsen of Arbutus, Md.

* * *

VERNON J. WORREL is the new executive vice-president and general manager of Ryan Equipment Co., of St. Paul. Making the announcement was C. T. Morris, vice-president of Outboard Marine Corporation, parent company of Ryan. Morris, who is chairman of the board of Ryan, was named president, succeeding Earl W. Nystrom. Morris also is divisional manager of Cushman Motors.

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For More Details Circle (117) on Reply Card

New 88" Mow-Safe Flail Mower

—the safest mower made for large acreage cutting

Mow-Safe crew-cuts grass like a lawn mower—but has none of the limitations nor high upkeep of the reel type. It's as simple as a rotary—but without the shortcomings or hazards. Handles grass and weeds without scalping or windrowing, at adjustable heights from ¾" to 6."

Mow-Safe is the safest mower going. The rugged steel housing and in-line cut deposits cuttings—and bottles, cans, wood, stones, etc.—directly to ground for maximum protection of operator, children, passers-by and buildings. Exclusives include factory-balanced rotor-blade assemblies and a built-in floating link that permits mower to follow contour, independent of tractor. Mow-Safe incorporates D-ring mounted reversible flails that swing back when hitting obstructions and automatically return to cutting position; precision steel-cut gears in a 40,000 psi tensile gear box; shielded PTO and drive shafts; job-mated knives and accessories. For 3-pt. pick-up Category I tractors. Mow safe with Brillion. Mail coupon today.

If Brillion builds it— it has to be better!

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Dept. MS-41-41, Brillion, Wisconsin 54110
FEMA

Please send information on the following:

- ○ Mow-Safe Flail Mower
- ○ Terra-Scaper Rake
- ○ Turf-Maker Grass Seeder
- ○ Smooth Roller Pulverizers
- ○ Landscape Seeders
- ○ Name of nearest Brillion dealer

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State _____ Zip _____

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SEED
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For More Details Circle (114) on Reply Card

Your Standard Is Best Course Golfer Sees on TV; Dunlap Elected

Golf management must "care" about the golfer—the fellow who is paying the bill—the Midwest Regional Turf Foundation conferees were told at its annual meeting at Purdue University.

Marvin Merritt, assistant supervisor of the Cincinnati, O., golf public recreation commission, pointed up change in public golf in the 1960s in reading a speech prepared for delivery by the commission's supervisor, Robert J. Strauss. Strauss, recuperating from an illness, was unable to attend.

"Public link golfers are demanding better courses. Competition is keen for the greensfee dollar. He migrates from course to course. His locker room is the trunk of his car, and he knows what a first class course looks like because he sees them close up every weekend on television."

Course superintendents must constantly stay abreast of changes in management practice, he said. These have multiplied. Public courses are crowded seven days a week, from sunup until sundown. Problems in getting the work done have increased, and this may mean some maintenance will have to be done under lights.

Golfers are increasingly demanding year-round golf, he added, noting that Cincinnati's municipal golf receipts in January, 1971, were more than $13,000.

Design of new publicly operated courses has these characteristics: easy walking terrain; large greens and tees—so markers and cups can be moved more frequently; wide open fairways, minimum rough for low cost maintenance and fast play; few, if any, sandtraps; and watered fairways, if free city water or natural water is available.

The future of golf is tremendous, he said. He also foresees tremendous opportunities for new, well-trained golf personnel who possess enthusiasm, love of work, and capacity and willingness to learn.

A Purdue student, John Thorne, said that growth regulating chemicals have a bright future in turf management. Among them are compounds which inhibit formation of seedheads and reduce grass leaves, thus cutting down on the frequency of mowing.

Five Purdue University students specializing in turf studies received a total of $1,200 in scholarships.

Recipients of golf course superintendents' scholarships valued at $350 each were William C. Brazeau, West Lafayette, and John R. Cartmill, Evansville.

Other recipients were Lee Overpeck, West Lebanon, $200 Mueller sod scholarship, and Barry Sage, Seymour, and Richard D. Hudson, Warren, each $150 Michiana golf course superintendents' association scholarships.

Officers of the Foundation, elected for 1971-72, are John Dunlap, superintendent, Oakwood Club, Cleveland, O., president; Louis E. Miller, superintendent, Louisville Country Club, Louisville, Ky., vice-president; and W. H. Daniel, Purdue turf specialist, executive secretary (reelected).

New directors are David Fearis, Peoria, Ill., James Timmerman, Orchard Lake, Mich., and Dudley Smith, Orland Park, Ill.

More than 600 attended the conference, co-sponsored by the Foundation and Purdue's agronomy department.

INTERESTED IN AQUATIC WEED CONTROL?

Join the Hyacinth Control Society —a group dedicated to control of all noxious weeds.

Individual Memberships $5/yr.
Commercial Companies $95/yr.

Annual Meeting: July 11-14, Hotel Manger, Tampa, Fla.
(Commercial members invited to exhibit free)

Contact **Stanley Abramson,** Society President
5414 North 56th St., Tampa, Fla. 33601, Phone (813) 626-2111

For More Details Circle (120) on Reply Card

classifieds

When answering ads where box number only is given, please address as follows: Box number, c/o Weeds Trees and Turf, 9800 Detroit Ave., Cleveland, Ohio 44102.

Rates: "Position Wanted" 10¢ per word, minimum $3.00. All other classifications 20¢ per word, minimum $4.00. All classified ads must be received by Publisher the 10th of the month preceding publication date and be accompanied by cash or money order covering full payment. Boldface rule box: $25.00 per column inch.

USED EQUIPMENT

1968 FORD pickup and camper, $2,445. IHC twin screw tractor, $2,950. Tandem flat bed semi trailers, $400 to $2,000. Roseman mowers, 7 gang, $1,200. Ryan 18" sod cutter, $500. 1963 40' thremo tandem trailer, $2,250. 6,000 lbs. Towmotor fork lift, $1,750. Foulkes Sod Farm, Phone: Fall River, Wisc. 414 484-3941.

SPRAYERS, chippers, log splitters and other equipment at large savings. Let us know your needs. Equipment Sales Company, 5620 Old Sunrise Highway, Massapequa, New York 11758.

FOR SALE—51 winch truck, choice condition, 30,000 actual miles, 8' and 20' poles, 40' boom for climbing or taking off large, high limbs. Parsons Tree Service, R3, Parsons, Kansas 67357. Phone: 316 421-0868.

FOR SALE: Ryan, Jr., sod cutter. Good condition, $300. Phone Wilmington, Delaware 302 478-1266 after 6:00 p.m.

FOR SALE

FOR SALE—50 acres highland Kentucky nursery turf. Rich silt loam. Rolled, Weed sprayed, gangmowed. $400 per acre. Greenfair Nursery, 1030 Upper Ridgeway, Elm Grove, Wisc. 53122. Phone 414 782-9312.

HELP WANTED

WANTED: Top-Notch Tree-Service Salesman. The man we want has a degree in forestry or equivalent, five years' experience in selling tree work, hiring and managing tree and landscape crews, and is ready to accept responsibility and progress with man, you will be well-compensated, a dynamic company. If you are the with top salary, company car, with bonus and commission geared to performance. And a liberal pension plan. You will be proud to sell our services to homeowners, utilities, municipalities, and industries. We are one of the nation's top 10 tree care and landscaping businesses, and growing. As we grow, you grow, too. Write us about yourself, or send a resume. Your reply will be treated confidentially. Write c/o Box 66, Weeds, Trees and Turf, 9800 Detroit Ave., Cleveland, Ohio 44102.

Industrial waste materials that represent disposal problems, effluent sludge from paper manufacturing and tree bark from sawmill operations, are being used to grow tomato plants. The research program is being conducted by Arthur D. Little, Inc., for Crane & Co., Inc., Dalton, Mass. For agricultural purposes, the combination of the byproducts is more effective than either of the mixture's components alone. The resulting earthen composition has excellent texture and water-retention characteristics and provides for good air circulation. Its possible uses are as a mulch, soil amender, and carrier for fertilizer and herbicides.

SEEDS

SOD QUALITY MERION SEED for discriminating growers. Also Fylking, Delta, Park, Newport, Nugget and Pennstar bluegrasses as well as fine fescues. We will custom mix to your specifications. Michigan State Seed Company, Grand Ledge, Michigan 48837.

EDUCATION — BOOKS

AUTOMATIC IRRIGATION Correspondence Course—A comprehensive ten-lesson course on basics of automatic irrigation. Covers the necessary hydraulics and electricity, pipe, valves, heads, controllers, soils, water requirements, programming, system maintenance and electric trouble shooting. Includes latest developments in all phases of irrigation. Students include superintendents, landscape contractors, suppliers, designers. Write for free outline and information. Larson Company, P.O. Box 4453, Santa Barbara, California 93103.

3 BILLY GOAT Indoor/Outdoor Vacuums

One man with a Billy Goat becomes a big clean-up crew. Original machine BG60 is available in self-propelled (P) and push (A) models, with gasoline or propane engine, battery or electric with cord. For all models—optional intake hose for hard to reach areas.

Model	HP	Snout width	Blower housing	Application
BG60	8	30"	Steel	Industrial
BT70	8	30"	Steel	Grounds, parks
KD40	4	26"	Steel	Lawns, drives

BILLY GOAT
INDUSTRIES, INC.
Dept. WT4, Box 229, Grandview, Missouri 64030

For More Details Circle (104) on Reply Card

trimmings

MIDWEST TURFGRASS GROWERS Association offered a survival kit to its members recently as a promotional idea. The kit was a 15x32-inch plastic sign with one-inch raised letters in red and green on white background. The sign said. SURVIVAL KIT — Actively growing grass on a plot 25 sq. ft. (5x5 ft.) releases enough oxygen to sustain life day after day for a living person. It also performs the following functions: Purifies the air, traps dust particles, eliminates bad odors, transpires moisture, washes the air, muffles noise, controls sun glare, and beautifies the area.

If you're interested in how the promotion worked out, contact Bill Latta, MTGA president, P.O. Box 9268, Kansas City, Mo. 64168.

* * *

YOU JUST CAN'T PLEASE everybody, the old saying goes. Take the situation in Toronto. Nix on DDT, the bird and other wildlife proponents said, even if all the elm trees die. So the next best way to control Dutch Elm Disease was to cut down infected trees. Hold on, the wildlife proponents are now saying. Quit cutting down those dead trees. They make good homes for raccoons, flying squirrels, wood ducks, woodpeckers and hawks!

A completely dead elm doesn't spread DED. The dilemma, however, is how to get an infected elm to "completely dead status" without infecting healthy trees, and then how to keep the dead tree from falling on someone's house!

* * *

DENVER LANDSCAPE CONTRACTOR Lew Hammer, Inc., recognizes individuals for "outstanding achievements in saving valuable trees." Six recent recipients were: highway department employees Harvey Atchison and Dick Brasher who saved 250 pine trees representing 2,000 years' growth, through engineering modifications and transplantings during construction of I-70 through Mount Vernon Canyon west of Denver; Glen Jacoby of the University of Wyoming for saving trees at a new stadium construction site for beautification of the university's golf course; Jerry Kemp, Yuma city manager for saving trees transplanted into the High Plain golf course and recreation area; Jerry Morris of Rocky Mountain Tree Experts of Denver, for major influence in saving elm trees threatened with disease; and Harry Vogel of Vogel Construction Co., Denver, for helping save trees marked for destruction at the Chatfield Dam site.

* * *

WEEDS RESISTANT to simazine and atrazine have shown up in nursery plots at Puyallup, reports the Seattle Times. Dr. George F. Ryan, research horticulturist at the Western Washington Research and Extension Center, said the chemicals had been used once or twice a year for the past 10 years. Resistant strains were noticed, he said, but within a couple of seasons weed control has been lost. The weed that became resistant is common groundsel.

1270

- EXCLUSIVE SPRING-ACTIVATED FEED PLATE eliminates need for flywheel; assures faster, quieter operation. Automatically takes larger size wood without adjustment, extra power, or extra fuel.
- FOUR MODELS with wood capacity from 4½" to 7" dia.; a variety of power units.
- EMERGENCY SAFETY STOP SWITCHES at top and bottom of feed apron.
- PATENTED TWO-WAY DELIVERY CHUTE for side or front chip flow (optional).

Ask for a demonstration to see the BIG DIFFERENCE in brush chippers!

FITCHBURG CHIPPER

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The Dow Chemical Company, Agricultural Department, Midland, Michigan 48640.

Dursban insecticide–the unsurvivable one.

Nothing does-in mosquitoes like Dursban® insecticide. This adulticide-larvicide controls all species, gives unexcelled control in waters with high organic content. And Dursban gives good residual control and is biodegradable to boot. Available now through your formulator or your Dow distributor. Use Dursban and mosquitoes will quit bugging you.

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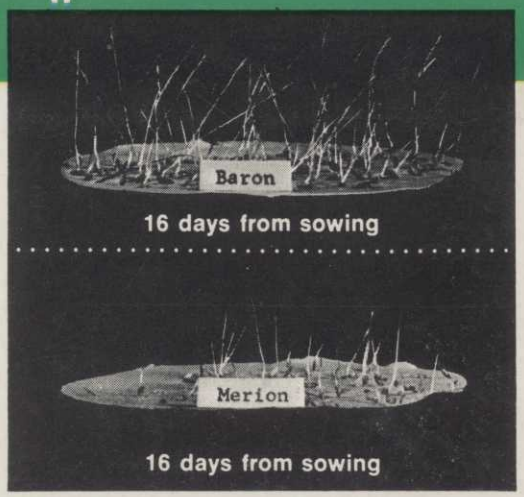
New in America...
from LOFTS

Available August, 1971

baron

Kentucky Bluegrass



Germinates faster, grows slower and denser— resists leaf spot.

The Baron is here! After its discovery in Holland and extensive rave reviews from Agronomists throughout Europe, Baron Bluegrass has come to America . . . another exclusive from Lofts Oregon and Washington growers.

Baron is a Kentucky Bluegrass unlike any other discovered thus far. It germinates faster than most varieties —yet once germinated, it reaches a deep green density that makes it ideal for sod, sports locations and prestigious lawns. Baron grows slowly, so it requires mowing less often; and it takes low mowing beautifully, even as low as ¾ inch. The sturdy, broad blades interlock to make a "crisp" surface that holds a golf ball well on the fairway. The dense turf is winter hardy with a fine winter color. Its leaves stay relatively unblemished by leafspot, rust or stripe smut.

In fact, in every way that matters, Baron Bluegrass from Lofts is the most remarkable grass seed you can buy.

Husky BARON cluster left, common bluegrasses right, mowed about one inch.

Check these remarkable figures!

	Per 100 seeds after 14 days.	
	Germination	Green leaf*
Merion†	19%	9 inches
Baron‡	85%	77 inches

† Average, two lots. ‡ Average, six lots.
* Calculated by laying all germinated seedlings from 100 seeds end-to-end.

Abundant roots and rhizomes show in BARON sod washed free of soil.

LOFTS

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